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The Gas Appliance Testing Laboratory—Part I

The Department a Necessity to the Progressive Gas Company—Of Real Value in Developing New Uses and the General Application of Gas to Uses Already Recognized—Personnel and Layout

By H. M. RILEY AND L. B. WILSON, Jr.

Consolidated Gas, Electric Light and Power Company of Baltimore, Baltimore, Md.

It can be stated without fear of contradiction that the Gas Appliance Testing Laboratory has passed safely through its embryonic period. In the past few years this department of the industry has developed from a more or less insignificant department where a few appliances were tested by haphazard rule-of-thumb methods to one of the most important and scientifically conducted branches of the industry. It may be said that the appliance laboratory is at the present time undergoing that process which has contributed so greatly and which in fact is essential to the success of all scientific and industrial effort, namely—standardization.

To many readers it may seem strange that standardization has not been complete in this branch of the industry, which is itself chiefly concerned with applying this factor of efficiency to the industry of which it is a part. The very fact that this standardization is manifesting itself in increased efficiency is ample vindication for the existence of the Gas Appliance Laboratory, and particularly is this true in the case of those of us who realize that standardization is one of the last stages in the process of technical evolution.

It seems appropriate at this point that we briefly consider the necessity of the testing laboratory, for even in this country there are those whose boundary stakes of development were driven by their ancestors, and to such a one the necessity of this work may not be apparent. Happily, excessive veneration for tradition is not a National characteristic, and it is probable that the pre-eminence attained by this nation in every phase of industrial development is largely the result of its attitude of ready acceptance of new and better methods.

The primary reason for all testing work is for the most part to obviate, insofar as is possible, the occurrence of troubles which will render less economical the physical accomplishment of the task at hand. The value of test work in this connection is not confined to any one of the many fields of industry. Steel is subjected to careful analysis and test, for the steel that goes into our structural members must withstand with safety the load to which it will be subjected, the steel that makes up our keen-edged tool must be such that the edge will remain keen, and the steel that is to be found in the delicate watch spring must possess qualities which are peculiar to the need.

By analysis and test of fuels we ascertain that one better than another will produce a certain amount of heat energy with which to accomplish a particular operation.

It is superfluous to carry on this illustration further for the value of test work is recognized too generally to make this necessary. This value is in direct ratio to the importance or magnitude of the project and it is this fact that has of late years created the necessity for the gas appliance laboratory.

Use of Gas Growing

A glance at the accompanying diagram showing the output of gas, mileage of mains and leakage, which appeared in the last annual report of the Consolidated Gas, Electric Light and Power Company of Baltimore will show the reader that the use of gas is growing, not so much because of additional territory covered by the distribution system, but because of the more general use to which it is being put.

This means but one thing—the development of new uses and the more general application of gas to the uses already recognized, and it is the Gas Appliance Testing Laboratory which has added much to the accomplishment of this result and which must safeguard the industry against increased troubles, with the resultant expenditure of much economically unproductive capital and labor.

There is still another matter beside the conservation of the capital of this industry which the selection of trustworthy and efficient appliances by a public service company will create, and that is the greatest, though somewhat intangible, asset of public appreciation and

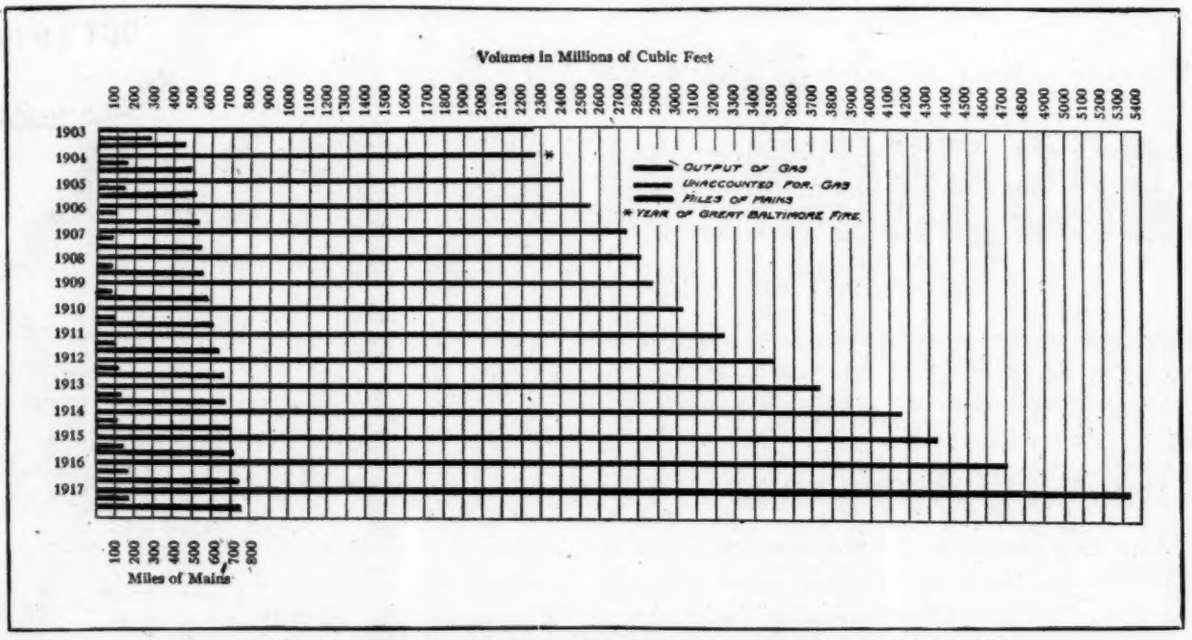


CHART SHOWS GRAPHICALLY HOW GAS CONSUMPTION HAS PROGRESSIVELY INCREASED

the cultivation of the good will of the consumer, which, in the end, is the acme of good business.

This brings us to the point that involves the selecting and compiling of basic data and methods so that different appliances of the same class can be measured impartially by the same yardstick, so to speak, and, as a matter of fact, the "yardstick" should be essentially the same in New York, Chicago, Baltimore or London, otherwise, there will exist a tendency to confuse and hamper the manufacturer.

Moreover, the standardization of methods renders technical and business communications between different gas companies, vastly more understandable, and will largely eliminate unnecessary misunderstandings with manufacturers, by establishing the fact that there is considerably more to the all around worth of an appliance than the grade of metal and manner of assembling and appearance.

With these brief thoughts in mind, it is the writers' idea to compile, or attempt to compile, a manual of standard methods of testing different gas appliances and also to embody therein some useful and necessary tables of data, which will facilitate the laboratory man's daily work. Later on in the series there will be dealt with in some detail, kindred testing that can be well handled by the Appliance Testing Laboratory, which work, the writers think, belongs legitimately in this department of the Gas Company.

We trust, then, that the reader will consider the effort in the following series of articles in the nature of a trail blazer and that the articles will serve the useful purpose of placing the work on a firmer basis. And after all, but little lasting good can come from a work of this nature if the reader does not temper his final judgment with the thought "It is easier to be critical than correct."

Personnel of Laboratory

Naturally, the most important equipment in the laboratory is the brain power, and the choosing of the proper men (particularly the one in charge) demands not a little thought on the part of the superintendent, or whomever the laboratory directly reports to. This is so because the work of the laboratory, with its various problems to solve, offers to the prospective employee probably the best opportunity for learning the gas business that is to be found in the entire gas company's organization, which fact entails the selection of the man who can step from time to time with confidence and ease to the positions of greater responsibility.

Let us attempt to prove this latter statement before enumerating the qualities and traits necessary in the laboratory man, by specifically recounting where the laboratory's work will take the man in charge.

To begin with, he must be in communication from time to time with the manufacturing plant, in order to discuss such matters as the quality of the gas as it might affect the operation of the appliance out in service.

He, obviously, is in frequent conference with the New Business Manager, which is of great value to him in acquainting him with the commercial aspect of the company's business.

The Appliance Installation and Complaint Departments demand his advice very often, because their operations of installation and maintenance can very seriously influence the proper performance of the gas appliance in use.

And so it goes with the other departments of the company, for there is hardly one with which the laboratory man does not come in contact.

If the laboratory man is alive to his opportunities, he will, in the vast majority of cases, be enabled to gather and store away, a considerable amount of knowledge from each of the departments with which he comes in contact, which fact, if properly appreciated, renders it possible for him to become a very valuable man to the company and one who is capable of development and advancement in the ranks as opportunities present themselves.

To get to the point in question then, these qualities should be possessed by the man directing the work of the laboratory.

1. Executive ability.
2. Necessary Education.
3. Originality.
4. Neatness and Strength of Will.

Executive Ability

A great many laboratory men possess sufficient ability to record data and observe pertinent points during the running of tests on appliances and even possess the faculty of correctly interpreting the results and finally producing the completed report, but fail woefully when they are face to face with the proposition of seeing that the work runs along smoothly and that tests are turned out on schedule time. This qualification is very necessary, particularly when one takes into account the fact that the work of the laboratory is anything but a routine matter. And this absence of routine work is likely to cause a considerable loss of time between tests, particularly if the one directing the work is not thoroughly capable.

Then, too, the above-mentioned attribute entails the ability of keeping more than one test going at the same time, which chiefly necessitates the foresight necessary to determine whether one test will conflict with another at some point in the course of procedure, whether by requiring the same apparatus, or attention at the same time.

To illustrate this point in another way—it is closely analagous to the chemist who is operating a consulting laboratory handling a variety of chemical tests.

Also the laboratory chief is constantly in close and intimate contact with his men, toward whom he must maintain an attitude that is both firm and congenial. Altogether, the qualification of executive ability cannot be too strongly emphasized.

Necessary Education

Just as to exactly what constitutes the amount and character of education the laboratory chief must have had can undoubtedly give rise to an interesting discussion among gas engineers and managers. Some might favor a mechanical engineering graduate, others a chemical engineer and still others a straight chemist, and, as a matter of fact, in certain individual cases each could be right in his contention. But as an average proposition, the authors' experience leads them to believe that the chemical engineer is entitled to the first selection, and afterwards the chemist and mechanical engineer in the order named.

However, we must offer an important proviso to the order of our choice and that is, that the candidate has a very thorough knowledge of chemical and metallurgical calculations. This proviso we will later explain at greater length.

Now let us endeavor to justify our selection of the chemical engineer, that is, a chemical engineer from a school of recognized standing. In the first place, the chemical engineer has been educated to attach the proper significance and weight to certain observed phenomena. His whole schooling has been rather in the direction that fosters quantitative rather than qualitative thinking, not to mention the feature of a training that makes for accuracy in noting and recording data.

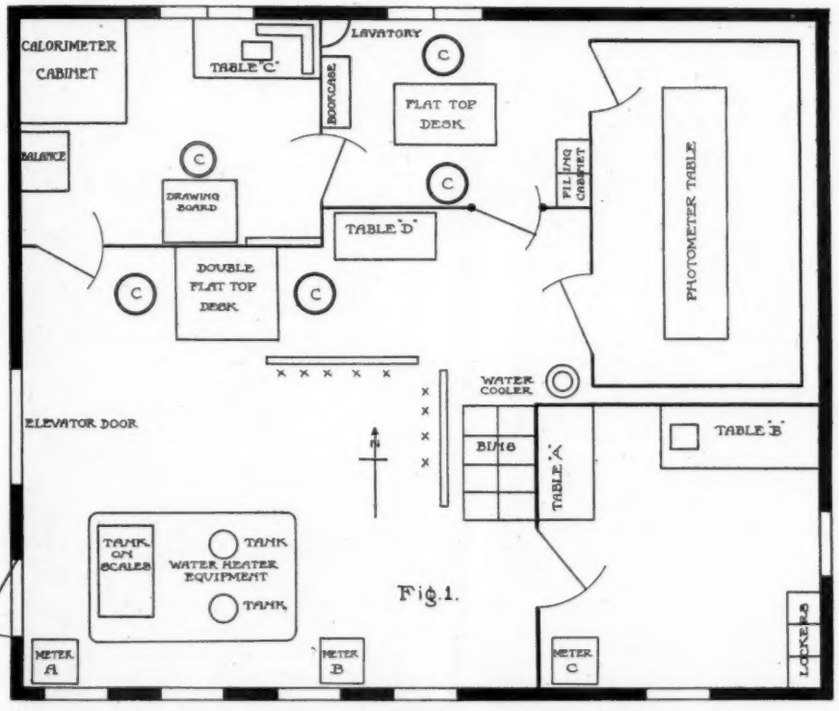


Fig. 1.

A LAYOUT MODEL FOR AN EFFICIENT TESTING LABORATORY

Secondly, he has a good working idea of mechanics and mechanical drawing, which enables him to digest at a glance the functioning and purposes of certain moving parts on an appliance, such as an automatic gas water heater, thereby allowing him to make the proper estimate and criticism in his final report. Incidentally, he can, if necessary, execute a credible drawing, which is worth a good deal.

Next, the chemical engineer has an excellent chemical training, which immediately makes him at home with any work of a chemical nature, which, as we all know, is constantly cropping up in the work of the laboratory. And here it may be said with certainty that our laboratories will, in the future, encounter more and more problems to be solved that will require more or less involved chemical investigation.

To illustrate, we may mention non-corroding paints for automatic water heaters, preservative coatings for the inside of gas furnace smoke pipes, dyes and gums for gas tubing, appliances involving mediums to be treated which undergo a chemical as well as a thermal change, etc.

Also, the man in question is the possessor of an intimate insight into the matter of heat evolution and

application. That is, there is nothing mysterious to him as far as the proposition of handling steam problems is concerned. Then, too, he is conversant with such matters as converted heat, radiant heat, conducted heat, transfer of heat, etc.

Lastly, our candidate, above all things should be almost as much at ease working out heat problems as doing a problem in addition. And in this matter we do not mean such simple problems in Stoichiometry as are usually encountered in figuring out the volume of a flue gas, but rather he should be able to successfully handle ones that could be classed with the proposition of calculating the heat balance on a Lowe Water Gas Set with the necessary data given. For sooner or later, our industry is coming to the point where we will be furnishing gas to run chemical operations involving endothermic and exothermic reactions and the like, and the laboratory man will either know or not know how to test the appliance and interpret the results—there being no half-way in a matter of this kind.

Originality

The laboratory offers a very fertile field for the man who has the trait of originality, which will enable him to handle the testing of new appliances with confidence and enthusiasm. He must of necessity be constantly contriving new schemes for estimating the worth of the many new varieties of appliances that come on the market from time to time. Or if a new scheme is not necessary at the time, he must frequently fashion out a method from a combination of ideas he has culled from previous tests. Then, too, he may be called upon to suggest ways whereby an appliance can be brought nearer to perfection.

But his originality should not run away with his common sense and tend to carry him skyward; rather it should serve to impress upon him that he is engaged in a seriously practical work.

Neatness and Strength of Will

Neatness is a characteristic which is most desirable in an individual, no matter what his position may be in the business, scientific or social world. However, there are of course certain lines of business whose success is not essentially dependent upon the degree of neatness and order which is maintained. In the world of science this attribute is not merely a desirable one, it is essential and without it a full measure of success cannot be had.

The importance and economic worth of neatness is today recognized in every walk of life. No more do we walk into a doctor's office and find it filled with musty, dusty books, cases of surgical instruments which show the effect of slovenly care or a desk covered with a litter of books and correspondence. There may be such offices found in the medical profession today, but I state advisedly that we do not walk into such a one, for the modern medical science dictates scrupulous cleanliness and care.

No longer do we find the office of the modern business man a place of confusion. The use of the flat top desk, rather than the roll top desk is today becoming more general, simply because of the absence of those pigeonholes and nooks and crannies which once made the roll top desk seem so desirable.

In the Appliance Testing Laboratory, neatness and order must be of prime consideration. The laboratory itself must be laid out with this thought in mind. The apparatus and all instruments of measurement must be kept with great care and in their proper places, for much of the equipment is quite delicate and fragile, and if allowed to lie around promiscuously, will require frequent replacement.

The appliances under test must be kept in proper condition, for many of them are to be placed on sale following the completion of the test. The data on the test must be recorded neatly, for otherwise in the final calculation and analysis, this fundamental information will be illegible or confused to the extent that it cannot be utilized, and the physical test must be repeated in order to gather together a new set of data. The final analysis and calculations must be made with care and attention and the report compiled and presented in a form which is appropriate to the high order of the work involved.

Strength of will is an attribute of character which is necessary to the laboratory man who successfully conducts the work of this department, and at the same time improves the opportunity to prepare himself for positions of first importance in the industry. A man may have had unusual educational opportunities, may possess much latent executive ability and may be neat and orderly in the conduct of his personal and business affairs, but if he is lacking in strength of will and unity of purpose, he will never attain the desired results or receive the general respect and confidence of his associates. He may possess every other essential to success but if he is weak and vacillating he will be a failure.

Strength of will in the laboratory man will successfully carry him over the difficulties and perplexities which the primal nature of the work makes inevitable. Strength of will in the laboratory man will insure judgment, distinguished by justice and devoid of partiality.

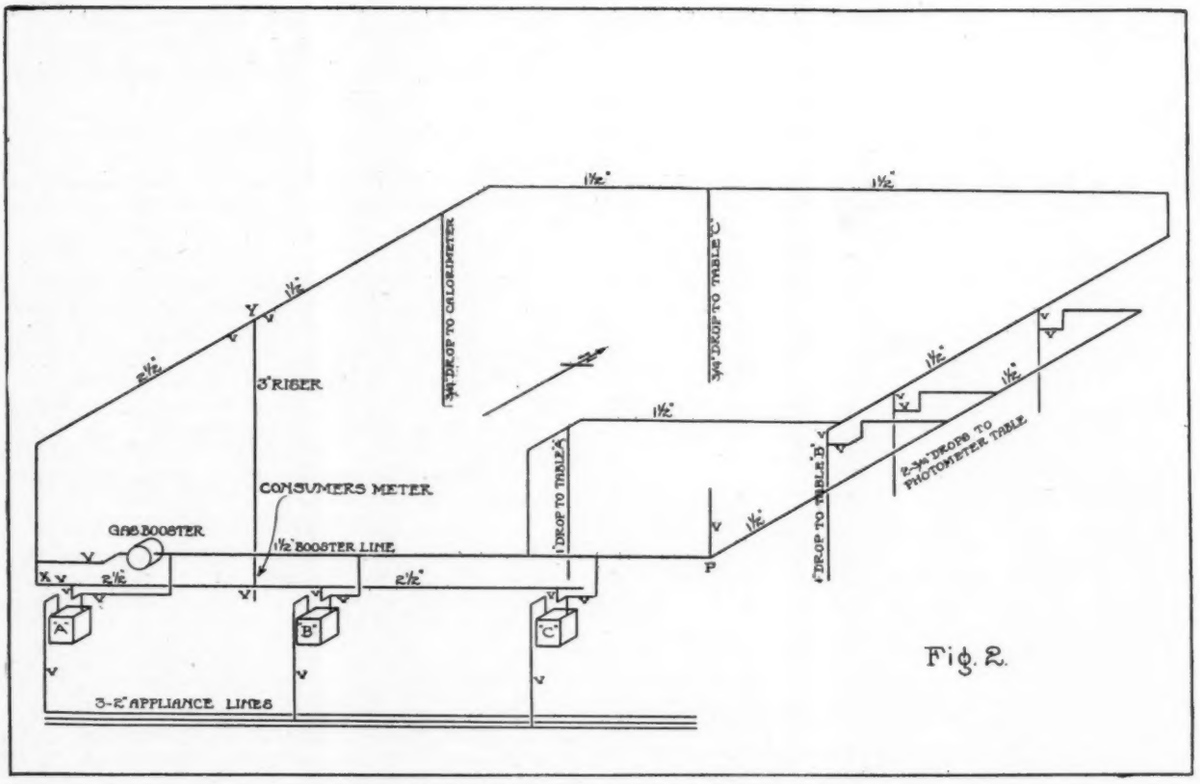
A man having this characteristic will, once having reached a conclusion, vigorously defend the propriety of his judgment. The laboratory man must be open to conviction and susceptible to proof, but unless he is prepared to intelligently defend his judgment, he will oftimes cause his employer embarrassment, with the resultant loss of confidence, which might prove disastrous to his career.

Layout of the Laboratory

Naturally, the layout of the laboratory will be largely governed by the shape and size of the building in which it is to be contained. Incidentally, this should be one of the Distribution Department's buildings. However, regardless of shape or size, it should be located on the top floor of the building so that flue pipes, etc., can be lead through the roof and into the air, thereby giving an ideal flue condition. If the laboratory is situated on one of the lower floors, it is both difficult and expensive to lead the flue pipes into the air, and one generally has to resort to the expedient of going through windows which makes a rather awkward installation.

Like other kindred laboratories, it should have plenty of light and ventilation and there should be an elevator leading into it or else close by so that the reception and discharge of heavy appliances can be handled with dispatch.

As regards the flooring, some will prefer concrete, which is durable and at the same time fireproof, but on the other hand, it is very tiring to the men's feet and is



PIPING ARRANGEMENT FOR LABORATORY OUTLINED

difficult to cut into in case new drains and piping are to be run through it. The writers lean toward a wooden floor of good quality, covered with a first-class grade of brown linoleum, or a new substance on the market which is applied in a plastic condition and is said to be tough and impervious to moisture, acids, etc.

The walls should be painted dark brown for a height of about 4 ft. from the floor, and the remainder a flat white. The ceiling also can be of a light color, which gives a pleasant effect. And remember to keep the laboratory in a neatly painted condition—it pays.

Inasmuch as the laboratory chief is in frequent communication with his men, it is deemed best not to have his desk surrounded by a partition; however, it might be well to have a neat railing for moral effect.

The planning and locating of the gas, water and air supply lines entails a good deal of though and farsightedness, otherwise in a few years the changes and extensions will result in a very disorderly conglomerate of piping.

Remember also, not to be timid in the use of stop cocks and tees and a good rule to remember in laying out the pipe lines is " Use a tee wherever you need an ell." In this way, at future times it will be found much cheaper and quicker to remove a plug and complete the extension than to take down a lot of piping, remove an ell and reassemble.

The water, gas and air lines should be painted in different colors, so as to be easily differentiated.

Figure 1 shows the plan of a laboratory roughtly 33 ft. long by 28 ft. wide and planned to accommodate one chief and three assistants. Incidentally, such a sized laboratory should take care of gas companies' needs in cities of from 250,000 to about 750,000 population; however, as we well know, no hard and fast rule can be laid down in this respect.

In the northwest corner is located a room about 9 by 12 ft. and intended to take care of all work of a chemical nature. It contains a full calorimeter equipment as well as a gas analysis apparatus and specific gravity jar. These two latter are situated on table " C " which is equipped with a sink and a reagent bottle rack. Any other small chemical glassware can find a location on this table, whose top should best be of soapstone about two inches thick.

Just to the south of the calorimeter cabinet is a sensitive chemical balance, properly supported by means of a very substantial base so as to reduce vibration to a minimum. A drawing board on which the laboratory's drafting work is done, and a neat glass front cabinet for thermometers, etc., completes the equipment of the chemical room.

The partition enclosing the chemical room should be solid up to a height of about 4 or 5 ft., and then glass almost to the ceiling. Ventilation openings, covered with heavy wire cloth are provided near the floor and ceiling in the partition. One large double window admits natural light to the room.

Just to the east of the above-mentioned room is the laboratory chief's office, the same being partially enclosed by a neat wooden railing with a swinging door.

The equipment for the office is adequately shown in the first figure and perhaps needs no further explanation, except to emphasize the feature of doors leading from it to adjacent rooms and the matter of a flat-top

desk, which is much more efficient and vastly cleaner than a roll-top one.

Isolation Room in Which Heaters are Tested

The photometer room is located in the northeast corner and is about 8 by 13 ft. As can be seen, it is set about a foot away from all walls and partitions in order to be properly ventilated and for purposes of temperature control. Properly spaced and sized openings (wire gauze covered) should be provided for ventilation and two flues should bleed off the waste gases through the roof and out into the air. A photometer table is provided, and if necessary, an integrating photometer can be housed in this room.

On the south side of the chemical room will be noted a double flat-top desk which can accommodate two of the men when making their calculations or writing up reports, etc. Incidentally, it should not be occupied too often.

Outside of the office is table "D" which serves the double purpose of containing a tension machine and acting as a work bench for minor fitting work. A vice is on the eastern end of the table, which should be of heavy oak construction. No gas, water or air is necessary for this table.

In the southeastern corner is shown a room 12x12 ft., and surrounded by a wall or partition of about the average thickness as found in the home. The feature of this room is that it can be practically isolated and used to test room heaters, gas steam radiators and other kindred devices. Also it contains the clothes lockers and two work tables. Table "A" is to be used for testing small appliances such as irons, toasters, percolators, etc. It contains, in addition, the mantle bumping machine. Table "B" can be useful in testing sundry small appliances and has a sink which is used when conducting tests requiring water. Both of these tables are supplied with small laboratory meters.

We cannot too strongly emphasize the need of a room of this character.

The bins are for small nipples, fittings, valves and sundries and are handy things to have, particularly where quick connections are needed and one does not care to go to the general storeroom for such parts.

Underneath the bins a cupboard can be made for holding kitchen utensils and other paraphernalia.

Along the south side of the main room are three accurate wet meters of different capacities and located in permanent positions.

The water-heater equipment for testing circulating water heaters, automatic water heaters, etc., in the southwest corner, contains two 12x48-in. galvanized tanks, scales and rectangular tank on the same, for holding water to be weighed. The whole sets on a raised metal platform with a drain to the waste pipe.

The Xs show white roller curtains hung on the ceiling and used as a background when taking photographs of appliances.

The west wall has an elevated door through which the appliances have a straight path into the laboratory.

No table should be equipped with a cupboard underneath, for at best they are dirt catchers and make for discomfort when one sits at them while testing.

In studying this plan, it might occur to the reader that there is little room for storage of appliances while waiting for test, and in this connection let it be said that the laboratory is *not* a store room and it is not thought necessary or shipshape to have a lot of appliances standing around. Their place, until needed, is in the general storeroom.

Piping Layout

For the sake of avoiding confusion, the air and water lines have been omitted in Figure 2, likewise the flue piping.

In the west end will be seen a 3-in. riser.

Although it might seem somewhat large, a 3-in. riser from the service is advised as the main gas supply to the laboratory, and also this riser should preferably be fed by a separate service from the main. The 3-in. riser ascends to within about 18 in. from the ceiling and connects to a 2½-in. main supply line running south. This 2½-in. line drops down 3 ft. and continues easterly to a small gas booster, located close to the wall and supported by a strong wall bracket. (Booster is motor driven.)

From the booster a 1½-in. booster line takes off and feeds along its east and west length, the three laboratory meters "A", "B", and "C". At point "P" a vertical bleeder or purge line (2½-in.) extends through the ceiling and roof into the air.

The booster line continues north from point "P" and supplies the 12x12 test room and the photometer equipment.

At point "X" the main supply line connects with a 2½-in. low pressure feeder line situated about 6 ft. from the floor and about 2 ft. from the south wall and running eastward is dead ended just inside of the 12x12 test room. It will be also noted that the low pressure feeder line supplies the three laboratory meters.

A 1½-in. main supply line takes off from the 3-in. riser at point "Y" and continues northerly, easterly and southerly, supplying along its length the chemical room, photometer room and tables "A" and "B."

Along the south wall are shown three 2-in. appliance lines, about 2 ft. above the floor and extending into the 12x12 test room. These can be used for either high pressure or low pressure gas as desired. Short nipples project horizontally from the appliance lines and have attached on their ends, five or six foot lengths of a good quality of 2-in. rubber hose with union ends. These are extremely useful in making rapid connections to appliances and when not in use, can be hung up on the wall by means of a small chain and hook.

Valves are indicated by the letter "V" and governors are permanently located on the 3-in. riser, at the outlet of the gas booster and on the inlet to each meter.

If very high pressures are required, which are liable to overtax and strain the meters, it would be a simple matter to parallel a set of high pressure meters with the laboratory meters by means of a by-pass connection.

Flue Line an Item of Importance

A casual study of this layout of gas piping, which, it is felt, is very simple, will show the great flexibility of the system which allows of a maximum number of operations with a minimum of interferences. The particular pipe might seem too large, but experience advises to the contrary, and after all it is better to be on the safe side as regards size.

In order to avoid confusion, the water and air lines

have not been shown in Fig. 2. However, the problem of their installation and size is a simple one.

Another item of importance is the flue line which runs along the south wall about 3 ft. from the ceiling and 5 or 6 ft. from the wall. It should be about eight inches in diameter, and have three or four 6-in. taps in the under side and three 6-in. vertical bleeders leading through the roof. Openings should be provided for thermometers, draft gages and gas sampling tubes and when not in use, the 6-in. taps are to be closed with tight-fitting caps or plugs.

As stated above, the size and shape of room at hand largely determines the layout of piping, etc. but above all things, simplicity should be the watchwword, and too, a little preliminary study and thought will forestall a large amount of trouble and confusion later on.

Paris Gas Companies Make Strong Effort to Retain Good-Will of Consumers

Use of Women for Maintaining Gas-Lighting Equipment —Municipalities Sharing Risks in Works Operations

BY FRANCIS MILTOUN

To-day I bought the last of what might be called "free coal" that I shall be allowed to buy for some time in Paris. Hard coal is at the price of diamonds. I paid the equivalent of sixty dollars a ton for the last of the latter that I was able to get. To-morrow we have "coal cards"; we may get 66 lb. a month, or we may get 396 lb. a month, or we may get some quantity in between. We do not know as yet. Coupons of the coal cards will give their possessor as many "units" of ten kilos as the visible stocks will allow.

France has established itself as a coal dealer and we shall virtually have our transactions with the government through the medium of the coal dealers as distributors. Our coal will be *tout venant,* the run of the mine, whatever may be in stock, and the price will drop to 5 francs 50 centimes the sack of 50 kilos, this approximately $22 a ton, which is cheap according to what we have been paying. For the rest it will be a question of gas—if it only holds out.

All Paris is wondering just what will be the exact gas and coal situation for the coming winter. We have had decrees and regulations with regard to most of the commodities of modern life ever since the war began, and some that have been made overnight have gone into desuetude the next day. It looks now as though the whole situation of domestic lighting and heating and cooking for the winter would be considerably improved over what it was this last rigorous winter, but this presumes a milder winter in the first instance, and in the second instance on the supply of raw material, which, in this case, is coal. We might add the labor unit too, but one way or another that can probably be conjured.

It is to be hoped that no local gas companies will be obliged to shut down for the lack of coal, even temporarily, though with the coming of the long nights, when gas will be used for lighting as well as for cooking, there may be a reflex of inconvenience for us all, including the companies, which after all are the people's friends, though they have hard work sometimes getting this fact accepted.

One thing which seems to have been brought about by the strenuous times of the past year is that the principal gas offices in Paris have established a sort of a permanent service, night and day, which is supposed to give the subscriber an explanation as to why his gas is as feeble as it is, why it does not come through at all at times, and whether he may expect a more liberal or a lesser supply, though the answer for this at this moment would probably be equivocal.

All this shows a disposition to more than meet the public half-way at a time when everyone is as nervous and jumpy as a cat and only too ready to kick, as well at imaginary causes of grievance as for real ones. Usually the answer has been: "It is the war," and that has supposed to suffice for all complaints. In some cases it may have been justified, in others not.

We are getting used to mystic signs and symbols in war-time Paris. The latest is the red-lamp danger signal put out at big *carrefour* and street refuge lamp-posts, which for military safety reasons, or some others, are not lighted at night. Thousands of gas street lamps are dark and form dangerous reefs against which all manner of wheeled vehicles run amuck with astonishing frequency. Doubtless there is not enough gas to go around, but this is by no means the fault of the companies which are in the business for supplying illuminant. For the real reason one has to look farther than this. At any rate the red light before the door of the district gas office, where there is an all-night service, is a move in the right direction, and any subscriber who thinks he cannot wait for daylight may drop in. This is service plus. When it comes to sending a man around to "fix things" that is another matter. More likely it will be a woman.

The last employee who came to renew the mantels on the burners throughout my modest establishment was a young woman, her kit slung over her shoulder and spare mantels and tools as handily laid out as if she had been born to the work, or had been a mere man. I have seen those of the male persuasion less competent; indeed she was rather better and more agreeable to have around than the rheumatic substitutes for the regular force which have been doing the work since the war began.

I mention these things for they look this way to the man-in-the-street and the gas subscriber who pays the bills. The opinions are worth while usually to any organization which has a commodity to sell the public. The gas companies in Paris have come to a realization of this and there is a decided improvement in the services which they are rendering to-day over that of any time since the beginning of the war.

Gas consumption will no doubt be largely affected by the new coal regulations which went into effect Sept. 1. If you are a gas subscriber you are allowed only so much coal for cooking; if you are not you are allowed rather more. The matter of heating is a thing apart, and that is worked out on a similar schedule. The scale is figured on the basis of the number in the family, which seems rather ridiculous; certainly the cubic contents of the rooms to be heated and lighted would have been more nearly a correct formula. At most a family of two is not likely to get more than 396 lb. per month for all purposes if they have not a gas connection; if they have the amount is likely to be even less. This is, of course, very little, but the French normally heat their apartments very little, often only one room at a time and some never.

At most the provision is but 10 lb. a day or a little more. The only salvation is being able to supplement

coal with gas, for heating as well as for cooking. If we are not regulated as to gas, as we were last winter, we may get through. If we are we shall probably go and sit in a café to keep warm or in the Bibliotheque Nationale, which is always warm. Those who have gas canalized in their homes have decidedly the best chance of getting comfortably through the winter, but there is no chance of getting a new installation, chiefly from the lack of labor to put it in, the lack of meters waiting to be installed, and the possible lack of a sufficient gas supply to handle more than the estimates already made.

Two suburban Paris gas companies are at the moment in the throes of balancing their budgets. That of Rambouillet, because it cannot get coal deliveries from its regular sources of supply, and because of this deliberately did the only thing it could do—shut down until conditions should improve. The other is Versailles, which took the bovine by the horns and put through a new price scale with the concurrence of the municipality. The city authorities are to audit the companies books each month and bills are to be rendered on the basis of cost plus an agreed-upon profit for the period of the war, the city on its part, guaranteeing to find the coal necessary to keep the plant going. This is real co-operation, and got an immediate guarantee of twenty thousand tons to be delivered as wanted. At Nice on the Riviera where all public service perforce enjoys a *regime de faveur,* as much as anything because Nice and the surrounding country lives off the winter tourist, has by common accord between the municipality and the gas company arrived at a modus vivendi whereby the normal price of gas to the domestic consumer has been raised 35 per cent. A combination of the two plans, where neither one nor the other would seem to be possible of accomplishment, seems ideal in times like these.

In Paris we are still getting a feeble blue flame, but it can be brought up to white heat by mantels, which is more than can be done to the dull red glow of electricity. Then there is the question of whether or no we shall be able to sufficiently augment our heating, supplementing that 396 lb. of coal which is to be our maximum monthly ration for this winter. Gas will certainly help.

Effect on Consuming Devices of Mixed Artificial and Natural Gas

Frank S. Honberger Describes Experiments Made to Determine if Stratification Takes Place—Effect on Meter Diaphragms—Burner Orifices

The first question which confronts the adoption of natural gas as a portion of a mixed artificial and natural gas is the possibility of stratification taking place when a gas of 0.700 specific gravity is added to one of 0.500 gravity, declared Frank S. Honberger in his paper on the effect of such mixtures on consuming devices, prepared for the annual convention of the Pacific Coast Gas Association. In order to gain information concerning the diffusion of gas, a method described in Traver's "Study of Gases" was employed by the writer.

Quoting from text book, the following statement is made on the diffusion of gases: "This term, though employed by Graham in describing the passage of a gas through a porous septa, should more properly be applied to the mixing of two gases brought suddenly into contact over a free surface. The subject was studied by Loschmidt of Vienna and the results published under the title of 'Diffusion of Gases without Porous Septa.' A glass tube, 1,000 mm. long and 55 mm. in diameter, was divided in the middle by a thin steel shutter, in which a hole, equal in diameter to the inner section of the tube, was pierced. The two halves of the tube were filled with different gases and the shutter was moved so as to bring them in contact for a definite period of time. The degree to which the gases had mixed was determined by chemical analysis."

The apparatus used to verify the intimate mixing by diffusion and the non-stratification of the constituents of the mixed gases consisted of 20 ft. of 4-in. pipe, both ends plugged and a separating valve in the middle. Natural gas was charged into one-half of the pipe and artificial gas into the other. After charging either end with the gases in question, the separating valve was opened and the gases allowed to intermingle for fifteen hours, when heat determinations were made. Results were as follows:

Top	658 B.t.u.
	650 B.t.u.
Middle	648 B.t.u.
Bottom	651 B.t.u.
	648 B.t.u.

The artificial gas, of 0.500 specific gravity was introduced into the upper half of the 4-in. pipe and the natural into the lower portion.

Making Positive No Stratification Took Place

To make positive that no stratificaton took place, the position of the gases was reversed, the natural gas being introduced into the top, and the artificial gas into the lower half of the testing unit. A tabulation of the work of one test is given below.

Natural Gas	1,000 B.t.u.
Artificial Gas	625 B.t.u.
Top	810 B.t.u.
Bottom	813 B.t.u.

It will be seen that a mixture evidently took place, since the lower half had a heat value of 1,000 heat units and the upper a value of 625 heat units. Upon allowing the two gases to intermingle, the heat values are equalized, but three heat units difference in the showing between the upper and lower ends of the pipe.

After being assured that no stratification took place, considerable research was done to find the results of photometric observation upon various mixtures of natural and artificial gases, and to this end a series of such mixtures were made, ranging from 10 to 80 per cent of the natural product. The various combinations were then observed for heating value and candlepower, using a Junker's Calorimeter and a Queen Photometric Bar, respectively. With the bar, a certified "Metropolitan Argand Burner, No. 2," was used—since this burner is designed to give the best lighting results by the use of an air regulator.

A point, however, owing to air regulation, was reached, at which the above burner could not be used and an aluminum open tip burner was substituted. For mixing the gas, a 5-ft. gas prover was used. The heating value of the natural gas was 1,050 B.t.u. and the candlepower was 9 candles.

Instead of burdening the reader with a detailed account of the results of the individual cases, a brief summary will present the information acquired.

Per Cent Nat. Gas	C.P. Art. Gas	C.P. Mixture	B.t.u. of Mixture	Ratio of C.P. in Mix. to B.t.u. Mix.
10	18.74	19.22	592	30.8
20	16.57	19.51	640	33.1
30	17.55	20.77	700	33.7
40	13.16	19.26	687	35.7
50	17.33	19.50	688	35.3
60	17.48	21.20	748	35.3
70	13.99	21.38	782	36.6
75	14.65	20.50	825	40.2
80	16.40	10.35	871	84.2

An inspection of the above tabulation makes evident the fact that although there is a constantly decreasing percentage of artificial gas the candlepower is maintained up to the addition of 80 per cent artificial gas. With a constantly decreasing artificial gas content, but a rising heat value, the ratio of the candlepower to the heat units remains nearly constant up to a critical or breaking point.

A statement can be made at this point; with a gas of relatively high heating value, the candlepower does not seem to depend upon the amount of carbon particles present, but upon the incandescence to which they are brought. This seems to be true up to the just mentioned critical point.

Methods of Introducing Natural Gas

After having done the preliminary investigations upon gas mixtures in the laboratory and decided upon the practicability of their use, the question of mixing of larger quantities and controlling the proportions decided upon, arose.

Anyone of three distinctly different methods may be used to give the results desired (*i.e.*), mixing the natural gas in oil gas generators while the generators are engaged in manufacturing artificial gas; using natural gas as an enriching medium for water gas, in place of oil; mixing matural and artificial gases on the way to the storage holders, measuring the natural gas before the mixing takes place. Of the three plans the last one is undoubtedly the most feasible, since in both of the first two, an enormous amount of heat would be required in bringing the cold gas to the temperature of the generating apparatus.

Decreased Drippage

Natural gas as delivered to the meter station is usually at a pressure considerably in excess of that at which the artificial gas leaves the purifying boxes after being forced through them by the exhausters. Where station meters are being used the back pressure from the holders is the same against both the artificial and the natural gases, so that, with the latter delivered to the mixing station at a higher pressure than the former it is necessary to reduce this pressure by permitting the natural gas to expand into an expansion drum—the quantity expanded being governed by a valve in the natural gas supply line. In order now, to maintain the ratios demanded, close attention to the meters registering both gases is necessary. That it can be done with extreme accuracy is indicated by the fact that for months the ratio has not varied 0.2 per cent either way of the desired proportions.

In maintaining the heat value of the gas as required by city franchise and also the percentage of the natural product demanded in the mixture, the artificial gas generators are operated at heats which tend to produce considerable naphthalene. Before mixing with the natural gas this naphthalene is entirely removed in the scrubbing since the natural gas acts only as a diluent of this compound and tends only to decrease it in proportion to the ratio of the mixtures of the two gases.

Leaving the point of mixing and entering the distribution system especially after the gas has passed through the compressors the decrease in the amount of drippage over a 600 B.t.u. artificial gas is noticeable. It is easily understood since the artificial gas in the mixture has been generated at high heats and the complex oils originally constituting the drippage have been cracked to fixed gases and thus eliminated from the condensate. Not only is this due to the decrease in the artificial gas made but also in the fact that this article has been decreased in volume dependent on the proportion of natural gas added.

In switching from a 600 B.t.u. artificial gas to a mixed gas of artificial and natural, the leather diaphragms in the consumers' meters immediately showed the effect of the change and several diaphragms were examined. After making a series of observations upon these leathers a theory was evolved from the deductions made which has probably covered the phenomena noticed. Drippage, or condensate from a meter containing an exceptionally large amount, was examined and found to consist of a considerable quantity of a blue sludge or muck and a small quantity of benzol. This is probably a misnomer since the gravity of this oil was 35.4 deg. Be. while true benzol has a gravity of 28-29 deg. Be. at 60 deg. Fahr.

Effect On Meter Leathers

Upon acidifying the sludge with hydro-chloric acid it was found difficultly soluble and gave evidence of a dark green approaching to blue color. This sludge, upon being heated with caustic potash, lost its blue color and a heavy precipitate of ferric hydroxide was thrown down.

Upon leaching the dried leather with carbon tetrachloride and distilling off the solvent, no evidence was found of any mineral oil, though, of course, some animal oil was present. The leather itself was dyed a decided blue. From the foregoing observations, the following course of reaction of the artificial gas upon the diaphragms was deduced.

Artificial gas, coal or oil gas, contains some cyanogen compounds, which consist of carbon and nitrogen. These compounds, coming in contact with water, are dissolved and are naturally found in the condensation or drippage. In contact with the interior of the meters these liquid cyanogen solutions form iron salts, which are evidenced by the deep green or blue coloring of the sludge and the leather of the diaphragms. In composition these cyanogen salts of iron are probably akin to prussian blue. Further evidences of this action of the cyanogen compounds in the gas is found in this pipe scale, which at times stops small services, or scales and corrodes valve stems in some of the larger mains. All of these pipe scales contain large amounts of prussian blue.

In the meter the probable course of action is, first: the dissolving of the neatsfoot oil by the benzol and then coming in contact with the dissolved iron in the condensation, collected in the bottom of the meter, an iron soap is formed. In this way the presence of the

sludge is accounted for, as is also the fact that after admitting natural gas to the meter and drying up the condensation, the neatsfoot oil is not in a condition to be taken up by the leather again. Were a non-saponifiable oil used instead of the neatsfoot oil it is very probable that the mineral oil would re-oil the diaphragms upon the disappearance of the condensation.

After leaching the neatsfoot oil out of the leather, the leather is thoroughly saturated by the condensation, as is shown by the fact that the leather has been thoroughly dyed by the prussian blue in solution. This fact also indicated that practically all of the neatsfoot oil has been eliminated from the leather or the diaphragm would not have been so completely colored, since the water would scarcely have penetrated the leather in the presence of the oil.

Following the foregoing observation, it is evident that after the neatsfoot oil has been eliminated, the meter diaphragm is kept pliable, not by the benzol, since in some meters very little is found, but by the water of condensation.

The mere fact that the oil has been eliminated and the diaphragms kept pliable by the condensation, need not work any injury upon the leather were it not for the action of the dissolved iron salts in the condensation. These salts, undoubtedly, have a deleterious effect upon the leather. This now leads up to the question, is a re-oiled diaphragm as good as a new diaphragm? From the above observation, it would scarcely be in keeping to say that it would be.

It must have been observed from the preceding facts that the real cause for any injurious conditions in the meters is due to the fact that the gas throws down so much water of condensation. Where the artificial gas has been comparatively dry, this is plainly evident.

The time factor however, must be dealt with, since undoubtedly the element of time enters into the action of the gases upon the leathers. To expect the same effect of a large amount of gas through the meter in a short time is scarcely correct, since there must be time allowed for the condensation to collect, which is scarcely possible with the gas passing through the meter at a high rate of speed. Even were there a deposition of condensation, a high rate of speed would probably mechanically carry the condensation out of the meters.

To summarize, the following facts can be accepted: Dry gas, artificial, mixed or natural, has no effect upon the diaphragm. It is only when a large amount of condensation is present in artificial gas that the injurious effect is noted, since those detrimental constituents of the gas are put into such a form as to be chemically active. An artificial gas, entirely devoid of those obnoxious constituents, would have no injurious effect upon the diaphragms, even though it did carry a large amount of moisture. In the case of a mixed gas, the natural gas, which is practically inert, simply acts as a diluent and also as an absorbent for the excess moisture, in which case the moisture is carried through the meter to the burner. To say that natural gas has an injurious effect upon a diaphragm used with artificial gas is purely a matter of personal opinion. Granted that by drying out the moisture the leather is stiffened and the meter slowed down, can scarcely be said to be injurious. If the leather has suffered any actual injury, such as shrinkage of the tissue, it has occurred before the natural gas has come in contact with it. This has been caused by the astringent effect of the dissolved obnoxious constituents of the gas.

Effect on Consuming Devices

Coming now to the real subject matter in hand, the effect of a change in the quality of a gas upon the consuming devices in which it is to be used, the best possible manner of treating the problem is to generalize. In itself it is a rather difficult proposition upon which to do any extensive research, for the reason that the problem simply resolves itself into the application of various facts which apply to the phenomena of combustion. Let the person to whom the problem of solving the effect of a change in the heat value of the gas with which he is dealing become cognizant with the bunsen burner and the manner in which combustion takes place, no difficulty is experienced.

Whether the burner be a star, a ring, pipe or pedestal, the same general rules hold for the combustion of high or low heat value gases to be consumed by the respective device.

At this point it might be well to give a brief resume of combustion of a gas in a bunsen burner and then make applications to commercial burners and the variations caused by changes in the quality of the gas to be consumed. Any text book on the calorific value of fuel will give constants for a gas, *i.e.*, air necessary for combustion, the volume and weight of the products of combustion, etc., so that it is not necessary to mention them here. The air mixed with a gas prior to its combustion is called the primary air and brings about a partial combustion. If this amount be of proper proportion an inner cone will be produced of a color distinct from the rest of the flame. At the outer surface or envelope of the flame the unconsumed or partially consumed portions of the gas come in contact with the surrounding air and a secondary reaction takes place called secondary combustion.

Adjusting Burners

With the change in the quality of gas naturally a different set of conditions come into existence so that a burner adjusted for a gas of certain heat value and gravity must be altered in adjustment to burn the new gas to be consumed. The factors influencing this change are first the alteration in the composition of the gas and next the amount of air necessary to properly consume the new gas—both primary and secondary air must be taken into consideration.

It must be remembered that this paper is not an attempt to offer any suggestions upon the design of consuming devices but only a brief exposition of the means of taking devices already in existence, in fact, in service and with as few alterations as possible adapt them to the new condition which has been forced upon them.

With the assumption that the heat value of the new gas has increased, the explanation of any change necessary in adjustment, will be simplified.

As previously mentioned, one of the factors influencing the change in adjustment of a burner, is the composition of the gas. This may be evidenced by the increase in specific gravity, going on the supposition that this increased weight is due to an increased percentage of hydro-carbons and not carbon dioxide. A burner has usually been designed to burn a gas of a certain heat value—and within certain ranges, will do so efficiently and economically—but beyond this range, is overloaded. A simple comparison is to imagine a burner to be the fire box of a boiler which has been designed to handle a certain amount of fuel. Introducing into this burner, through an aperture originally designed for a gas of a

certain quality, a gas of increased calorific power, is identical with increasing the depth of a fire on the grates beyond the ability of the fire box to consume it. Still applying the simile of the fire box, the grate surface is sufficient to properly care for a certain amount of carbon or hydro-carbons. The same is true of the gas burner—it, too, is designed to properly consume a certain weight of gaseous hydro-carbons and beyond this weight it is overloaded, if the orifice or aperture is unchanged. If the slight effect of the increased gravity of the gas upon the volume flowing through an orifice be disregarded, it will readily be seen how a greater weight of combustible will be admitted to the burner with the increase specific gravity of the gas. With air at 32 deg. Fahr. and 29.92-in. of mercury a cubic foot weighs 0.0807 lb. A gas of 0.500 specific gravity will weigh 0.0403 lb. per cubic foot, while a gas of 0.700 specific gravity will weigh 0.0565 lb. for the same volume, or almost 40 per cent more. Were the orifice to remain unchanged it would be necessary to admit a greater volume of air to properly burn the additional weight of fuel admitted into the burner. If this is done an excessive volume of mixed air and gas is taken in and the burner is overloaded, which in turn would necessitate increasing the size of the openings of the burner to permit the combustible to escape. Were this not done "blowing" would be in evidence.

Changing Orifice Sizes

The foregoing has been but a brief review of what the conditions would be were an attempt made to use a richer gas in a consuming device designed for a leaner fuel. To meet the change it can readily be seen that the needed alterations consist in simply cutting down the amount of richer fuel admitted until it approximates the same weight as that of the leaner fuel for which the burner was originally designed. To cut this volume down, if the orifice is adjustable is an easy matter, if a spud, it can be hammered.

The problem does not, however, consist only in the permanent adjustment of the burner for a higher calorific gas, but in meeting the extreme conditions accompanying the sudden change caused by a variation of from 200 to 500 heat units. With such extremes a happy medium must be chosen which will permit safe consumption until proper economic adjustment can be made. With open burners the danger lies in extinguishing the flame only, with the oven, however, the possibility of an explosion is always imminent, because of the fact that the oven is not designed to carry away the products of combustion or partially consumed gases such as would be formed with an excess of gaseous fuel introduced in the case of gases of high calorific value. The "smothering out" of a flame is the difficulty encountered in oven burners and is the most difficult with which to contend. To alleviate this difficulty the oven flues must be increased in area as well as adjusting the burners.

The tabulation following shows the effect of a change in the orifice spuds upon gases of different heat values.

Test Made on Star Drilled Burner Such as Used on Top of Ordinary Gas Range

Temperature of room	78 deg. Fahr.
Barometer	29.57
Gas Pressure	7 in.

Conditions the same on all tests.

Test No. 1

Natural gas 1100 B.t.u.

With No. 43 spud used on 600 and 800 B.t.u. gas, primary air closed 2/3, burner on full, 2-2/10 lb. of water raised from and at 75 deg. Fahr. to 210 deg. Fahr.

Time 3 hr. 22 min.

Amount of gas used 1.19 cu. ft.

Test No. 2

Natural gas 1100 B.t.u.

After the gas spud had been adjusted to No. 53 orifice (selected for natural gas).

Primary air closed 5/6, burner on full, 2-2/10 lb. of water raised from and at 75 deg. Fahr. to 210 deg. Fahr.

Time 4 hr. 22 min.

Gas used 0.92 cu. ft.

Test No. 3

Commercial gas 50/50 mixture, 830 B.t.u.

With No. 43 spud (present adjustment is used in city).

Primary air ⅛ closed, burner on full, 2 2/10 lb. of water raised from and at 75 deg. Fahr. to 210 deg. Fahr.

Time 3 hr. 50 min.

Gas used 1.39 cu. ft.

Test No. 4

Commercial gas 50/50 mixture, 830 B.t.u.

With No. 53 spud (as selected for natural gas).

Primary air closed ⅞, 2-2/10 lb. of water raised from and at 75 deg. Fahr. to 210 deg. Fahr.

Time 5 hr. 30 min.

Gas used 1.27 cu. ft.

Take results on 830 B.t.u. gas as standard for comparison.

Comparison of spuds on same gas using the original spud No. 43 as standard since the appliance originally contained a No. 43 spud.

830 B.t.u. gas, 7 in. pressure.

	No. 43 spud	No. 53 spud	Results
Gas per hour	21.7 cu. ft.	13.9 cu. ft.	35.9% for No. 53
Efficiency	25.7%	28.2%	2.5% for No. 53
Time for heating 2.2 lb. water	3 hr. 50 min.	5 hr. 30 min.	43.5% for No. 43

Comparison of spuds as above with 1100 B.t.u. gas, 7 in. pressure.

	No. 43 spud	No. 53 spud	Results
Gas per hour	21.2 cu. ft.	12.6 cu. ft.	40.6% for No. 53
Efficiency	22.7%	29.4%	6.7% for No. 53
Time for heating 2.2 lb. water	3 hr. 22 min.	4 hr. 22 min.	24.7% for No. 43

Comparison of 830-B.t.u. gas and 1100-B.t.u. gas using same spuds (use 830-B.t.u. gas as a standard).

Number of spuds No. 43, 7-in. pressure.

	830 B.t.u	1100 B.t.u.	B.t.u.
Gas per hour	21.7 cu. ft.	21.2 cu. ft.	2.3% for 830
Efficiency	25.7%	22.1%	3.6% for 830
Time for heating 2.2 lb. water	3 hr. 50 min.	3 hr. 22 min.	12.2% for 830
Pounds per hour	34.43	39.22	
Lb. per 1 ft. gas per hour	1.59	1.85	16.4% for 1100

(*Continued on page* 382)

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Free Engineering Service to Consumers

With this issue we begin a series of articles on the gas appliance testing laboratory by H. M. Riley and L. B. Wilson, Jr., of the Baltimore company.

No thinking gas man can fail to concur with the view that the appliance testing laboratory will be a most important department in the gas company of the future.

When the time comes the gas man himself will know more about the appliance that burns his product. Then quality merchandise will be an actuality. We will not form our opinions of the merits of the appliances we buy on the basis of the statements of the man who is selling them, but on proved facts.

It behooves the gas man, therefore, to inform himself as to the ins and outs of appliance testing laboratory practice, to get a good general idea as to what its scope and purpose is, and as to how it should be managed.

The authors of this series are particularly well qualified to discuss the subject they will cover. The Baltimore company has found the appliance testing laboratory to be "good business." It has encouraged and developed it to a point that, considering the relative newness of the idea, is remarkable.

The AMERICAN GAS ENGINEERING JOURNAL advises all of its readers to follow this series. It is what might well be styled a series for executives, but those who have not yet attained that grade will do well to read just as closely, on the principle of being ready for the problems of the future when they are encountered.

Keeping Up the Industrial Load

Various natural gas companies are closing down on supplies to industrial fuel users. Some fear that the tendency will spread to the manufactured gas field. This JOURNAL feels confident that the fear is groundless.

We have made too strong an effort to secure industrial business to carelessly toss it aside at the very moment when the industry bids fair to reap its greatest harvest. Our strongest argument for gas as a fuel has been certainty and reliability of service. If we should shut down on a manufacturer from whom we had obtained business on this basis, we should be false to our own promises; in plainer terms, liars.

Gas companies continue to have difficulties in obtaining sufficient coal, but the Government has assured the country that supplies will be certain for industries essential to the prosecution of the war. Could any industry be more essential than the gas industry?

Well and true, some may argue, but why, as the AMERICAN GAS ENGINEERING JOURNAL contends, add to the problem, make the difficulties greater by pushing for more business; especially large volume business like industrial fuel? Will we not be acting more wisely

by merely taking care of the business we already have?

The more gas consumed the greater will be the possible supplies of toluol. Latest reports indicate that the Government will want all of this by-product it can get; and then more. The British Government is doing the gas companies' work in seeking to increase the use of gas.

Yet some gas men in this country would mark time in new business efforts; would be content to take care of that business they already have on their lines; worry greatly over the prospect of running into their precious reserves.

Successful efforts to put on industrial business will help the Government in that it will render more efficient and speed up production in innumerable lines of industry, in that it will economize labor to a large degree and thus increase the nation's man power, and it will, as has been stated, make possible the production of increased quantities of toluol.

Thus, in looking to our direct interests, we contribute largely to the nation's interests. Who then will hold back? Who will hamper the gas industry at this critical time; this period of unbounded opportunity to leap forward more than a decade towards making gas *the* fuel of the industries?

A More Efficient News Service

Early in the year the day of mailing of the JOURNAL was changed from Saturday to Friday, without any change in the time of closing the last forms. Thus the subscriber was given a report on current events in the gas field twenty-four hours sooner than he had been getting it. Beginning with next week's issue, another twenty-four hours will be lopped off the period between the event and the time the reader of the AMERICAN GAS ENGINEERING JOURNAL is informed of it, by an arrangement whereby the last editorial form will close a day later than has been the rule. Already we are planning to perform an even more efficient news service.

The "news" element has become an exceedingly important factor in technical journalism. Accustomed to being almost in hourly touch with general events through the remarkable achievements of the daily press, the gas man has become by degrees more exacting in his demands for a relatively prompt service in his business journal. In accord with this demand, the JOURNAL, beginning as a monthly publication, became successively a semi-monthly; then a weekly. Since then there has been a constant endeavor to lessen the period between the time the last copy left the editor's desk and the time the first complete numbers were in the mails on their way to the subscriber.

Only a year ago this period extended to as much as three days. With our latest arrangement it is reduced to twenty-four hours. We are now setting our sights at a twelve-hour period, and do not despair even of reducing it to six. This mark attained, from our present perspective at least, we will feel that we have approached as close to maximum efficiency in news service as it is possible to approach with a journal of this kind.

Gas Appliances in Store Windows Throughout the City

The AMERICAN GAS ENGINEERING JOURNAL has contended constantly that the sale of appliances is essentially the gas company's business. More harm has been done gas lighting, for instance, through the sale of cheap, miserable mantles in retail stores than it is comfortable to consider. If there was a means affected, however, by which the company could regulate the quality of the appliances the dealer sells, then indeed much good could be accomplished in seeking the dealer's co-operation so many recent speakers advocate.

A. L. Crane presented a tempting picture in his paper at the Pacific Coast Gas Association convention when he stated: "It would not be reasonable to suppose that a company with a location off the beaten track, with only one show window, could compete with anywhere from 40 to 100 or more dealers with their stores at widely scattered points, but at points with the best location in the business districts for show window display, for, remember, you must appeal to the women.

"She wants the easiest way—the cheapest way—the cleanest way, and it is up to the company and to the dealer to convince her that that way is gas and gas only.

"How can you best convince her? Simply by showing her every time she comes downtown (by means of attractive window displays and effective demonstrations) the advantages of the gas stove over the coal stove.

"There is no window display ever shown that can equal an attractive woman cooking on an attractive stove. An illustration of the latest appliances, attractively displayed, appeals to the window shopper as nothing else will.

"A woman is constantly on the lookout for an attractive labor-saving device for the home, and is constantly obliged to purchase necessary articles for the home. This takes her to a furniture store at frequent intervals, where it would never take her to the display of the gas company. Once in a store, it is a very easy matter to attract her attention to the gas stove demonstration, and ultimately to the purchase of a gas stove."

The point he brings out is an exceedingly important one. The number of electrical appliances that are sold because passers-by in the streets are attracted to the window display of some dealer—and they are innumerable in any city of size—are many. Gas appliances

lack in the general sense this advantage. It is not an exaggeration to state that one could travel quite extensively about the average large city day after day and year after year without once seeing a gas range—that is, of course, presuming that he kept away from the kitchens.

Dealer co-operation has its advantages and disadvantages. If a sure method could be arrived at to link it with efficient appliances those who have the best interests of the industry at heart could wish for no better development. If it means, however, a haphazard foisting of inefficient appliances upon an unsuspecting public then it is about the most harmful development that could occur. No publicity at all is preferable at all times to harmful publicity.

How the Gas Companies are Helping the Nation

THE PEOPLES GAS LIGHT & COKE COMPANY of Chicago is doing its bit toward bringing the war to a victorious conclusion in several ways. The gas company's boys were among the first to enlist following our entrance into the war and to-day enough employees of the Peoples company are in the service of the United States army and navy to make several complete companies.

To assist those who have remained at work in their battle against the H. C. of L. the Advance Club of the Peoples company's employees has established a co-operative buying system whereby the members are enabled to buy food at wholesale prices.

To help insure the success of the second Liberty Loan more than seventy of the women employees of the company have become volunteer overtime workers, remaining at the company's offices several hours each evening to stuff Liberty Loan application blanks into envelopes which are being sent to the 700,000 gas consumers of Chicago.

THE BROCKTON GAS LIGHT COMPANY, serving Brockton, Mass., has given the following ten men to the military and naval service of the nation:

John Connolly.....Navy
Leon Curtis.....Army
Edward Jordan.....Army

Hector Mongeau.....Army
James Moynahan.....Army
Richard Nagle.....Navy

Maurice Nathan.....Army
Fred Therrien.....Army
William Tormey.....Army

Harold Young.....Army

The company has 44 employees liable to draft. Ninety-eight employees subscribed $5,850 to the first Liberty Loan. Figures on Red Cross contributions are not available, but they were generous. The company assisted the Red Cross in its campaign for new members by addressing several thousand envelopes and enclosing circulars with gas bills. The company is to supply coke to the Charlestown Navy Yard and is making plans to install a toluol recovery plant in case it is called upon to assist the Government by supplying that by-product. George H. Priest is general manager for the company.

J. D. CAMERON BRADLEY, secretary of the Committee on Chemicals, in a letter to D. W. Jayne, secretary of the Sub-Committee on Coal Tar By-Products, states:

"The report presented by your committee on the difficult subject of Gas Scrubbing was received by the committee with considerable enthusiasm. The committee unanimously requested me to present to you its thanks for the fine work done and to express to you its appreciation of the large amount of labor and personal sacrifices involved.

"Will you kindly transmit the above resolution to Messrs. Gartley, Addicks, Ramsburg and your good self."

THE DEMPSEYTOWN GAS COMPANY, of Oil City, Pa., has given one man to the military services of the nation.

Effect on Consuming Devices of Mixed Artificial and Natural Gas

(*Continued from page* 379)

Number of spud No. 53.

	830 B.t.u	1100 B.t.u.	B.t.u.
Gas per hour.....	13.9 cu. ft.	12.6 cu. ft	9.3% for 1100
Efficiency	28.3%	29.4%	1.1% for 1100
Time for heating 2.2 lb. water	5 hr. 30 min.	4 hr. 22 min.	20.6% for 1100
Pounds per hour...	24.0	30.23	
Lb. per 1 ft. gas per hour	1.73	2.40	38.8% for 1100

TEST No. 5

Artificial gas 635 B.t.u.
With No. 43 spud, primary air open, 2.2 lb. water raised from 72 deg. Fahr. to 210 deg. Fahr.
Time 3 hr. 55 min.
Gas used 1.73 cu. ft.
Gas per hour 26.5 cu. ft.
Efficiency 27.7 per cent.
Pounds of water per hour 33.7 lb.
Pounds of water per 1 cu. ft. per hour 1.27 lb.

TEST No. 6

Artificial gas 635 B.t.u.
With No. 53 spud, primary air ½ open, 2.2 lb. water raised from 72 deg. Fahr. to 210 deg. Fahr.
Time 6 hr. 28 min.
Gas used 1.62 cu. ft.
Gas per hour 15.0 cu. ft.
Efficiency 29.6 per cent.
Pounds of water per hour 20.4 lb.
Pounds of water per 1 cu. ft. per hour 1.36 lb.

POUNDS OF WATER PER 1 CU. FT. GAS BROUGHT TO BOILING POINT

Number of Spud	No. 43	No. 43	No. 43	No. 53	No. 53	No. 53
B.t.u. of Gas.....	635	830	1100	635	830	1100
Pounds of Water...	1.27	1.59	1.85	1.36	1.73	2.40

From the preceding summary the effect of the change in orifice size upon the efficiency of the burner is made plainly evident.

Gas Displaces Oil as Industrial Fuel in Western Tractor Factory

Cost of Oil 10 Cents per Gallon, that of Gas 75 Cents per Thousand—Closing up Back with Fire Brick Adapts Gas Forge to Short Heats—Gas Also Preferred to Oil in Lead-Hardening Installations

By HARRY L. WOLFF

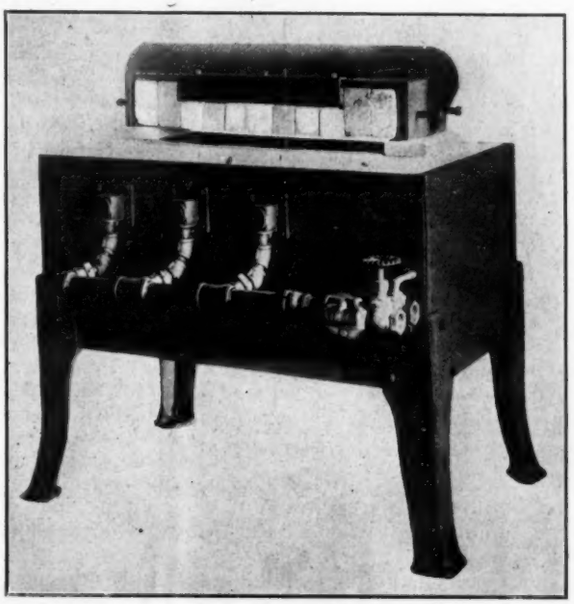
Industrial Gas Engineer, Rockford Gas Light and Coke Company, Rockford, Ill.

In a tractor factory in one of our Western cities crude oil was considered as the fuel to be used, and, as the factory was a new one, we asked the privilege of installing gas forges, subject to approval as to convenience, speed, comfortable surroundings and general superiority.

The principal operation under consideration was the upsetting in a bulldozer of tractor wheel spokes, size of pieces $\frac{5}{8} \times 1\frac{1}{4}$ in., and heated at the end for 6 in., each piece being heated twice and passing through two operations, the roughing and flattening.

High Temperature Work

This is high temperature work, being practically a welding heat. We outlined our desires to an appliance company after a careful survey of our customer's demands and installed the first furnace, it being lined with fire brick, with a facing coat of carborundum. This not being perfectly satisfactory we relined the furnace with high temperature cement, which is the best lining we have found and stands up about a week under the hardest operating conditions. The accompanying illustration shows the type of forge which we found to be most practical. The heating chamber is directly under the work and the adjustable top may be raised or lowered to just permit the entrance of the piece to be heated, the back being closed up with fire brick if short heats are being made.



HIGH TEMPERATURE CEMENT MOST SATISFACTORY INSULATING LINING USED IN CONNECTION WITH FORGE

The burners each enter at the bottom of a circular vertical chamber 6 in. in diameter and 4½ in. deep, the wall between the "wells" or chambers being ¾ in. thick at the narrowest point. Relining is done by packing the filler around a steel form which is then removed and the lining is then slowly dried. No special burners are necessary, as we use ¾-in. gas pipe burners with the end open and renew them when we reline the furnaces.

TYPICAL HARDENING ROOM WITH EQUIPMENT INCLUDING CARBONIZING FURNACE, OVEN FURNACE, OIL TEMPERING FURNACE AND FORGE

Gas Consumption 1,200 Cu. Ft. per Hour

The desired daily output of spokes was 2,000. We easily do this with two of the furnaces, having built a second one on the job to match the one we reconstructed to meet the special conditions at this factory.

Gas is served through 100 B-type meters at 4 in. pressure and air at positive pressure from a 3-3

Connersville blower at 1¼ lb. pressure. We installed recording pressure gauges on both the gas and air lines and will sell same to customer after they become conversant with their use.

The gas consumption of the two forges at their best working speed is 1,200 cu. ft. per hour. As we are using gas in various other operations in this and the company's adjoining factory, a rate is earned which shows a cost of less than thirty cents per hundred for making the spokes.

After getting the installation down to a proper working condition we conferred with the management of the factory, which stated that "They were fully satisfied that gas was the proper fuel to use." We are now able to have this perfected forge made up by the Eclipse Fuel Engineering Company of Rockford, after the plans and specifications of the appliances with which we got these satisfactory results, and have just completed the installation of two forges at Galva, Ill., in an agricultural implement plant that had been using crude oil. At this plant we found that about eighty-five per cent of their work in forging was "bends" of pieces of the following dimensions:

No. 1—1¼ × 3/16 in. strip soft steel heated for 6 in. Output 700 per hour from circular gas forge on a gas consumption of 160 cu. ft. per hour.

No. 2—½ in. round bar bent at 45 deg. Output 500 per hour. Gas consumption 160 cu. ft. per hour.

No. 3—1 in. round bar bent at end, 350 pieces per hour. Also various other pieces are heated and bent.

Welding Plowshares

We are welding corn cultivator plowshares, using a borax flux. This operation is done in the special forge as outlined previously and shown in illustration and is very satisfactory.

This factory is not one of the largest, and we found that a considerable waste was made by running oil forges. The many changes in specific gravity of the oil obtained, together with the fluctuations in costs, kept our customer in a constant worry. The price being paid for oil when he made this installation was ten cents per gallon. The gas rate earned is approximately seventy cents per 1,000 cu. ft.

At a factory in another of our towns, which has a contract to make transmissions for a truck used by one of the countries at war, we have recently installed a large carbonizing and annealing furnace, a 16 in. lead hardening furnace and various other furnaces using gas.

Lead Hardening Furnace

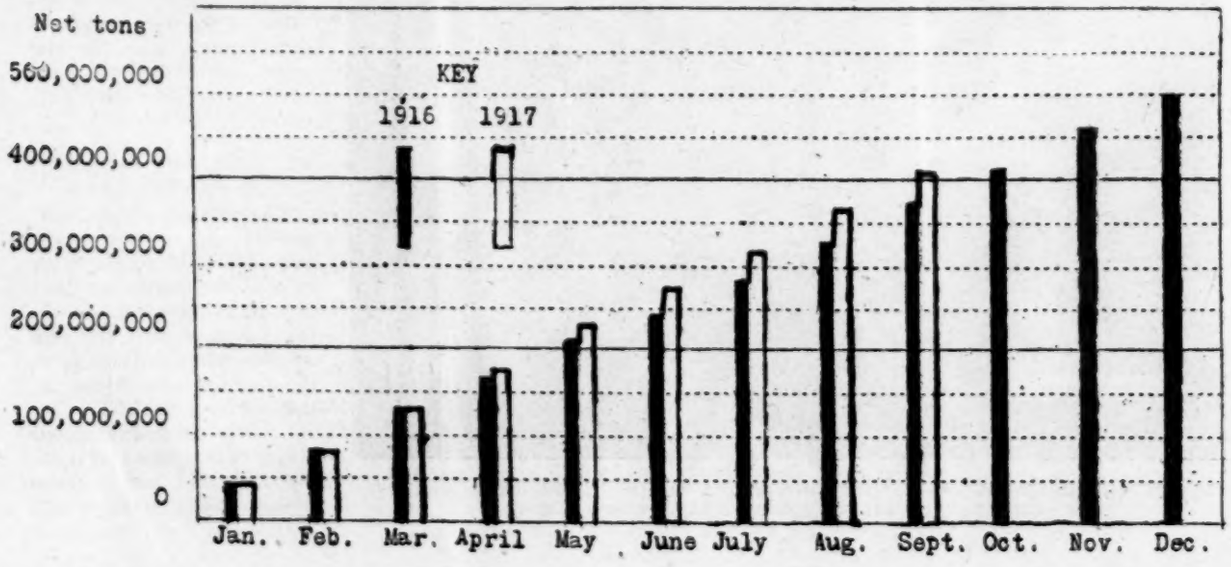
A feature of this type of lead hardening furnace is a patented skirt and shelf which extends around the top and level with it, being heated by the flue gases, and upon which the pieces are preheated before immersion in the red hot lead, it being necessary to preheat these parts owing to the sudden shock due to rapid change of temperature.

We now have nine of these lead hardening furnaces in operation in another transmission plant whose gas consumption in August was 556,000 cu. ft. Fuel oil was considered here but as a lead hardening furnace runs at from 1,450 to 1,600 deg. Fahr., it must be lined with brick and when using oil the uniformity of temperature cannot be maintained but mounts up and generally produces faulty and uneven hardening.

Coal Production in 1917 Shows Progressive Increase Until September; Then a Slowing Down

The September production of bituminous coal (including that made into coke) is estimated at 43,573,652 net tons. Although the total output was smaller in September than in August, the rate of production increased from 1,737,685 net tons per working day in August to 1,793,154 tons in September.

The total production from Jan. 1 to Sept. 30, 1917, was approximately 407,370,011 tons, an increase of 38,684,232 tons over the production for the corresponding nine months of 1916. The soft coal mines of the country continue to produce in excess of last year's output, but the rate of increase over the production of 1916 is slowing down. During the month of August the 1917 production gained 4 million tons over the corresponding 1916 production. During September the gain was only 1½ million. Expressing the same idea in terms of per cent, by the end of August the 1917 production was 11.1 per cent ahead of that for 1916; by the end of September it was only 10.5. Figures prepared by the U. S. Geological Survey.



News of the Gas Industry

Elimination of Large Electric Signs as a Means of Saving Coal

Suppression of electric advertising signs as a means of saving coal is suggested by Amedee J. Casey, of Chicago, publisher of the *American Coal Journal*. Mr. Casey suggests that this country follow the lead of England and France by placing large electric signs under the ban during the period of the war in order to conserve coal for more essential purposes.

"These electric signs are tremendous users of fuel," said Mr. Casey. "I estimate that in New York City alone they require an additional consumption of 10,000 tons of coal daily. Chicago uses up not less than 3,000 tons daily in this manner. Throughout the country I estimate that the coal used up by these signs reached almost 15,000,000 tons a year."

John E. Williams Appointed as Illinois Fuel Administrator

In the opinion of many, the beginning of the end of Illinois coal troubles is in sight as a result of the appointment by Fuel Administrator Garfield on Oct. 13 of John E. Williams as fuel administrator of the third largest coal-producing state in the country. Mr. Williams entered the industrial world through a coal mine at the age of eleven and was a coal miner in Illinois from the age of 13 to 30. Today he is best known as an arbitrator of labor and other controversies, having gained fame for such work in settling the claims growing out of the Cherry mine disaster.

Mr. Williams is the personal choice of Governor Lowden of Illinois, and his appointment is said to have the approval of coal operators and miners alike. With a serious shortage of coal in Illinois already noticeable, Mr. Williams' task will not be an easy one.

Well Struck Near Surface in Moline, Kan.

The Dodge well on the Backus lease was drilled in recently. The drill was sent into the gas sand only 13 feet and a well flowing 3,250,000 feet was brought in.

East Ohio Gas Company Shows Speed in Army Camp Installations

On Friday, July 13th, as narrated in the lastest issue of the *East Ohio News*, published by the company, an order was received from the officer in charge of the camp at White City, for the East Ohio Gas Company to lay service mains, set meters, and connect up appliances for their mess tent. At 8 p. m. that same day, all service lines up to meter location were finished by the service men.

The next morning, fitter Baker went out to the camp and took measurements for all necessary connections; at this time the mess tent had not yet been put up.

At 6 p. m. Saturday the army officer called No. 2 Works by 'phone, notified them that their tent was then in position, and asked if it were possible to have gas that same evening. Fitters Baker and Lynch left the No. 2 Works at 6:30 p. m., went to this camp several miles away, connected range, hot plate, etc., and turned on gas ready for use at 8:30 p. m. The soldiers at the camp appreciated the efforts of the fitters so much that they furnished them with a fine supper of bacon and eggs.

For Gordon Park Camp the East Ohio service department received an order to furnish gas for the camp on Friday, July 13, and at 1 p. m. of the same day the service men tapped a main on the Lake Front Drive, ran several hundred feet of 3-inch pipe under two boulevards and over a steep embankment to the meter location at shelter house, and finished up this service at 8 p. m. same day.

The fitting department received orders to connect six gas ranges and set meter; this order being received on Friday, July 13, at noon. At 1 p. m., same day, the fitters were on the ground, measuring up for piping to connect these ranges. It then became known that the ranges had not been ordered by the Government, and on the request of Lieutenant McNamara, W. P. Tibbens called at the factory of the Reliable Stove Company and selected all necessary ranges.

The ranges were delivered to the camp on Saturday morning, July 14, and the fitters had everything in complete working order by 2:30 p. m. same day. The original request by the army officers was that they be finished up by 3 p. m. Saturday, July 14, and the job could have been cleaned up on Friday if the gas ranges had been there.

For the camp at Edgewater Park an order for service was received on July 19, and on the afternoon of the same day the service men ran several hundred feet of pipe to the meter location at the mess tent. Late that same afternoon one of the fitters connected a hot plate for temporary use until the army gas ranges arrived the next day. The next day, at 12 noon, word was received at the West Side shop that the ranges were at the camp. In consequence all the ranges were burning at 4 p. m., in plenty of time for supper. This was appreciated very much by the soldiers, as they had burned up all the drift wood they could collect from old Lake Erie, and they were very profuse in their thanks and praise for the prompt service given them by the East Ohio Company.

Kansas Oil and Gas Leasse

Twenty-two leases came in at once to the Register of Deeds in Lawrence, Kan., one day recently, and practically all of them were given to one person.

The leases cover about 3,300 acres of land lying west and southwest of Baldwin, and embrace the lands of the Butels, Jordans, the old Ashby tract, and several other quarter sections and smaller tracts.

The leases are given to John L. Hanna of Franklin, Penn., and are not assigned. They contain the usual provisions of gas leases, and with an added provision to the effect that the leases shall be null and void unless a test well is put down within three months of the date of the leases. The test may well be put down on a tract that is embraced by the leases filed with this bunch.

Brockton Company Seeks Street Lighting

The Brockton Gas Light Company, of Brockton, Mass., has submitted a contract to the Town Selectmen for the installation of twenty 500-candle-power, high-pressure street lighting units.

One Million Feet of Gas per Day Is Predicted from Alabama Well

With the possibilities of supplying Birmingham (Ala.) with enough natural gas for domestic consumption for a number of years to come, the Gulf Producing Company recently brought in a big natural gas well on what is known as the Aldrich dome in Cahaba Valley, eight miles south of Birmingham.

The gas was struck at a depth of 230 ft., and the drillers expected to strike the big gas sand at about 240 ft. It is predicted that when the well is drilled in further it will produce upwards of 1,000,000 cu. ft. of gas every twenty-four hours.

The engineers and geologists of the company have accounted for at least four other sands, the deepest of which will be about 2000 ft. The last sand is expected to be the biggest producer of all, and may bring in 10,000,000 cu. ft., enough to supply the city of Birmingham. In addition there are prospects of oil being found in large quantities, gas having been found at the top of the dome strata, which leads to the probable conclusion that there may be large quantities of oil at the bottom of the dome.

The company plans to develop the field fully to determine just how rich it is in both gas and oil. A number of officers and engineers of the company went out to the dome when the well was brought in and are pleased at the prospects. The dome proper covers 3000 acres of land in the Cahaba Valley.

Franchise Granted Whereby Gretna, La., Is to Be Supplied with Natural Gas by 1919

The Gretna City Council recently adopted by unanimous vote an ordinance granting a franchise to W. A. Campbell, to install a system to supply Gretna, La., with natural gas by 1919. City Attorney Gosserand reported that the ordinance was legal. The franchise provides for 35-cent gas for small consumers and 15-cent gas for larger ones, a graduating scale from 15 to 30 cents being arranged for the latter. The city gets 20 per cent of the gross receipts at 35 cents and 10 per cent on the remainder. Mr. Campbell gave a guarantee bond of $10,000 and a bond of $1000 to cover damages of construction. He may organize a company.

An annual tax of 10 mills, the usual amount, was levied. The council decided not to undertake construction of the proposed road back of Gretna at this time on account of lack of funds. Alderman Burgmaster presided in the absence of Mayor Gelbke. Present were Aldermen Gugel, Burgmaster, Flesch and Schurb.

Possible Gas Famine Due to Coal Shortage at Detroit

Detroit faces a possible gas famine unless coal comes quickly.

At the Detroit City Gas Company it was said recently that the demand for gas is far above normal.

"We can't heat the city, and if the demand is made on usw e will not be able to furnish the gas," it was said. "Also, we are drawing heavily from our reserve supply of coal used in making gas and unless we get more coal soon our supply of gas may fall short."

Gas heaters are selling heavily, but the company discourages their sale, as it cannot furnish enough gas for all the stoves.

Company Organized to Develop Oil Lands in Eastern Colorado

The Flagler Oil & Gas Company has recently been organized for the purpose of developing oil lands in eastern Colorado. The company is incorporated for $1,000,000 and its principal holdings are near Flagler, Colo. The company is being rapidly financed, say its officers, and is ready to begin drilling as soon as a contract can be made or machinery and supplies secured. G. B. McFall & Company, 210 Continental Building, are the fiscal agents.

Wisconsin Company Files Cross Petition in Rate Case

The Wisconsin Gas & Electric Company, which has applied to the State Railway Commission for permission to increase its rates, has been cited to appear before the board in Madison on Oct. 24 to present arguments and evidence in the premises.

The petitioner is represented by Vandyke, Shaw, Muskat & Vandyke, attorneys, who have filed an answer and cross petition with the board, part of which follows:

"The respondent denies that its gas rates in Kenosha are discriminatory as compared with its gas rates in Racine, and, in that respect, alleges that there exists in the city of Racine a substantially greater density of business per mile of main than in the city of Kenosha; that on the basis of cost of service the comparative density of business per mile of main in said respective cities and a due regard to the cost of construction, maintaining and operating the high pressure transmission line by which gas is supplied to Kenosha from the common producing plant located at Racine, require that a rate be charged in the city of Kenosha sufficiently greater than the Racine rate to compensate the respondent for such increased cost of service.

"Further answering the original petition and by way of cross petition respondent alleges that since the year 1916 the cost of fuel used for the production of gas in the cities of Racine and Kenosha has increased over one hundred per cent; that by reason thereof and in consequence of other increased costs of operation the respondent's revenues have now reached a point where it is no longer earning a margin in excess of its fixed charges, if dividends upon its 7 per cent preferred stock be treated as a fixed charge; that an immediate revision of its gas rates in both the cities of Racine and Kenosha is necessary in order to enable it to meet the increased cost of fuel used for such gas service; that to meet such increase the rate for gas service in both of said communities should be amended by the inclusion of a fuel factor which will be increased or decreased according to the actual cost of fuel necessary to produce each thousand cubic feet of gas, or, in the alternative, there should be added to respondent's rates in each of said cities and to each step of such rates, a respondent to meet the increased cost of fuel."

Grand Rapids Company Limits Sale of Coke

The Grand Rapids (Mich.) Gas Light Company has limited sales of coke to stove size, on account of slow receipts and need of furnace size coal to make coke.

Demand for fuel has increased with coal dealers as a result of the colder weather.

Window Display at Chicago Keeps Salesmen Busy Overtime

A rather unique and effective method of displaying the merits of gas-heated washing machines was carried out at one of the branch stores of the Peoples Gas Light & Coke Company of Chicago recently.

One window of the store was fitted up as the old-fashioned and systemless kitchen with its old coal range, huge tin wash boiler, coal, wood and ashes lying around loose, an ancient oil lamp, a washtub on an old sawed-off chair and an antiquated wringer attached to the tub.

In this window was hung the following sign:

DRUDGERY
Makes Blue Mondays
and
Takes the Joy Out of Life.
SEE OTHER WINDOW

In the old-fashioned kitchen Mrs. J. H. Crego, wife of one of the company's salesmen, dressed as a negro laundress, between long periods of rest (and waste) washed clothes by the wash-board system, rubbing away for all she was worth. After wiping the sweat from her brow she would point to the next window in which a sign said:

KEEP YOUR HEALTH AND YOUTH
Lighten the Labor of the Home
Come in and See Them
Demonstrated
Sold on Easy Payments

The first night of this display of the difference between the old and new ideas on laundering resulted in the following sales: One Almetal washing machine, two E. Z. washing machines, two cabinet ranges and three kitchen heaters, together with innumerable good prospects.

The crowd attracted by the display compelled the gas company's branch to remain open until 9.30 o'clock at night although orders had been given to close shop at 9 o'clock.

Chicago Incinerator Campaign

The incinerator division of the Peoples Gas Light & Coke Company of Chicago is citing the present near-epidemic of infantile paralysis as the "driving-home argument" in their campaign to place a gas-operated incinerator in every residence building in the city. There are at least 150 known cases of infantile paralysis in Chicago just now, and health authorities in an effort to prevent spread of the disease to the proportions assumed last year, are waging an educational campaign against the garbage pail, the principal ally of the poliomylites or infantile paralysis germ.

A booklet issued by the Chicago department of health in this connection says: "Kill the fllies in the house. Do not allow garbage to accumulate." The Commissioner of Public Works has given the garbage pail further recognition as "The cradle of the fly" by ordering extra collections of garbage in every section where the disease seems to be gaining headway. And the health commissioner has recommended the appropriation of additional funds to make the collection of garbage daily.

The gas company's incinerator salesmen are using all these excerpts effectively to bring sales of small incinerators which can be installed in any home.

Atlanta Company Finds Printing Plant a Money-Saver

The stationery department of the Atlanta (Ga.) Gas Light Company, which used to have nothing but shelves of supplies and a couple of multigraphs, is now taking on the proportions of a regular printing office, and Manager H. E. Reynolds hopes to be able to do nearly all the company's printing before many months have passed.

The office has just added to its equipment a 10x15 Chandler press, which doubles the department's capacity on small-sized work. It has been operating for some time a Kelly automatic feed cylinder press. The department soon will be printing all the bills and blanks used by the company, an item which runs far into the thousands of dollars every year.

J. A. Caldwell, formerly with the Atlanta Envelope Company, has been added to the department as compositor and pressman.

Hartford-Manchester Welded Pipe Line Progressing—Air Test Breaks Window

The Hartford City Gas Light Company has a number of men working on Pleasant Street in the Meadow section installing a large gas main which, when completed, will supply the city of Manchester with gas from the Hartford gas tanks. As the pipe is laid a test of the pipe is made every day. Recently the customary test was being made, and as the men were lowering the pipe into the trench the plug, which holds the air pressure into the pipe line, was knocked out and the rush of air resembled an explosion. General Manager E. E. Eysenback said that the rush of air struck a pile of stones lying near and threw some of them into the air. One of the stones struck the front headlight of an automobile owned by G. Ellery Darlin, breaking the glass; another broke a window in a nearby house, but no other damage was done. None of the workmen or bystanders was hurt. The line is an 8-in. line, 10 miles long and each length is welded to the other by an acetylene gas flame, and when completed the pipe will be one continuous piece from Manchester to the gas works.

Same Prices Offered Next Year for New Bedford Street Lighting Contract

Oliver Prescott, president of the New Bedford Gas & Edison Light Company, appeared before the committee on street lights recently, to present a proposition for a renewal of the contract for lighting the New Bedford, Mass., streets, which expires this month. Mr. Prescott was accompanied by William H. Snow, manager of the company.

The company's proposition was to make a one-year contract at the same prices which the city is paying at present; to reduce the minimum number of gas lights from 1,200 to 1,000, and to take out the naphtha lights entirely.

In his statement to the committee, Mr. Prescott said that the company was greatly handicapped in the manufacture of gas at present by the practical impossibility of obtaining gas coal, so that it is necessary to make more water gas. This condition is due to the government's assuming control of the supply of gas coal, and shipping it to points where it is most needed, principally the big steel plants. He expressed the fear that if present conditions continued, the situation would be serious.

The committee was favorably impressed with the company's proposal as to the contract, and President Prescott was requested to put it in writing.

Massachusetts Gas Companies Make Large Gains as Shown in Fiscal Year Report

Massachusetts gas companies made a healthy showing for the past fiscal year, which ended June 30, 1917, as compared with the year before. Every one of the nine largest companies, compared herewith, show an increased output over 1915-16, and the totals of meters in use are also larger than ever before.

It is particularly noteworthy that the use of gas stoves has been greatly increased, due no doubt in part to the high prices of coal.

A remarkable fact connected with the Springfield Gas Light Company's report is that during the year 1916-17 only eleven gas meters were removed, while 3,690 meters were added.

San Francisco Rates Fixed

The Railroad Commission has decided the San Francisco gas case. The decision was written by Commissioners Thelen and Devlin and concurred in by the entire commission.

The rates established for gas sold in San Francisco for all classes of consumers are as follows:

For the first 10,000 cu. ft. a meter a month, 85 cents per 1,000 cu. ft; next 20,000 cu. ft., 80 cents; next 40,000 cu. ft., 75 cents; next 80,000 cu. ft., 70 cents; next 150,000 cu. ft., 65 cents; all over 300,000 cu. ft., 60 cents.

A minimum monthly bill of 35 cents a meter is established for flats and apartments where four or more meters are continuously served in one location and on one service. The minimum monthly bill for all other services remains 50 cents a meter.

The rates as established constitute a slight reduction for consumption in excess of 10,000 cu. ft. a month up to the heaviest consumers, who will pay a slight increase. The gross revenue yielded by the new rates will be substantially the same as that now derived by the Pacific Gas & Electric Company from its San Francisco gas business.

The commission finds that $14,042,050 is a fair rate base, that reasonable maintenance and operating expenses are $2,472,966 and that a fair annual allowance for deprecation is $259,550.

The Pacific Company has approximately 112,500 consumers of gas in San Francisco from whom it derived in 1916 a revenue of $3,909,590.

The decision draws particular attention to the increased cost of fuel oil and wages and says that if it had not been for large increased costs of these two items, a substantial reduction in the existing rates would have been made.

COMPARATIVE RESULTS OF OPERATION, 1916-17 AND 1915-16.

Company	*Gas Made and Bought		*Sold for Street Lights		Total No. Services June 30		Ratio of Operating Expenses to Gross Earnings
	1916–17	1915–16	1916–17	1915–16	1917	1916	1916–17
Boston Consol.....	7,070,771	6,408,317	139,040	138,500	96,953	95,606	70.44
Springfield Gas Lt.	1,185,235	1,018,501	790	3,404	26,677	25,225	73.96
Worcester Gas Lt..	1,094,699	1,008,691	7,683	7,511	17,701	17,064	....
Cambridge Gas Lt.	1,092,185	983,351	4,164	4,151	"not	known"	79.28
Lynn Gas & Elec...	1,043,399	944,239	896	481	23,194	22,521	66.8
Malden & Melrose.	998,019	867,202	....	....	22,998	21,863	71.34
Fall River Gas Wks	735,069	703,490	5,659	5,861	11,745	11,431	66.35
Lowell Gas Lt.....	784,857	696,952	18,333	18,438	Increase	392	69.9
New Bedford Gas & Edison Lt.....	720,983	648,206	22,817	21,163	14,523	14,037	71.5

* Note—Feet of gas given, *omitting thousands.*

COMPARATIVE RESULTS OF OPERATION, 1916-17 AND 1915-16.

Company	Gas Stoves in Use		Total Meters in Use	
	1917	1916	1917	1916
Boston Consolidated.....	Unknown	.....	175,083	169,734
Springfield Gas Lt.....	30,000*	27,199	42,098	38,419
Worcester Gas Lt.....	20,611	19,223	34,335	32,365
Cambridge Gas Lt.....	Not known	.....	39,139	37,475
Lynn Gas & Elec.....	18,856 / 33,650 appliances	49,279	32,505	32,466
Malden & Melrose.....	17,365	16,761	33,760	32,189
Fall River Gas Works.....	25,720	32,354	27,530	26,901
Lowell Gas Lt.....	21,366	19,906	26,201	25,324
New Bedford Gas & Edison Lt..	22,593	21,255	24,322	22,844

* Estimated.

Lower Standard for New Jersey Gas Refused by Board

Despite the plea that the United States Government needs toluol and other elements in the manufacture of gas at the present standard, for the manufacture of high explosives, the New Jersey State Board of Public Utilities refused the application of the gas companies of the State to lower the standard. Virtually every gas company in the state asked that the standard be lowered, and they laid great stress upon the needs of the Government. The application was fought by the New Jersey League of Municipalities and especially by the cities of Newark, Jersey City, Passaic and Paterson.

H. S. McBride, of the Bureau of Standards at Washington, testified that the Government was using toluol, benzol and that it was a patriotic duty to reserve every possible bit of these needed elements for the Government. It was shown, however, that a plant in Camden was eliminating toluol and still maintaining gas at or above the standard.

The board disclaimed any effort or intention to hamper the government, and that it would interpose no bar to the meeting of governmental needs by the companies under its jurisdiction.

Submarine Window Display Increases Sales at Quincy, Ill.

One of the most novel and effective ideas which has been brought to the attention of this journal for window display decorations was that of the submarine window of the Quincy Gas, Electric & Heating Company at Quincy, Ill. F. W. McLellan, manager of the commercial department, tells us of the successful campaign conducted in connection with this window display during the week of Sept. 8, in a recent letter.

REALISTIC SUBMARINE SCENE PRODUCED IN QUINCY, ILL., WINDOW DISPLAY

A No. 4 Humphrey water heater was used as a submarine in one corner of the window, and from the top of a light house in the opposite corner a 1,000 cp. flood light focused its rays on the water at night. Mosquito netting was used to give the water effect, on the top of which were a quantity of small boats. In the sea with the submarine were numerous imitation fish, scattered throughout the window, as can be seen in the accompanying photograph. The sign reading "$5 Off Regular Price" helped to increase the effectiveness and also attracted the pocketbooks of the bargain-hunters. The American flag and army enlistment posters in the back made it a most timely idea, and one which really had great pulling power. The display caused considerable mention in the local newspapers of the town.

A more recent campaign which the Quincy company conducted consisted of a baking demonstration each afternoon from 2 to 5 p. m. during the entire week of a recent stove sale. They offered with each stove a 24 lb. sack of flour. This matter was very advantageously arranged with one of the local flour mills which furnished the flour free to the gas company, as a means of securing advertising for itself.

The salesmen's efforts during this particular campaign were confined purely to the sale of stoves, the idea being that concentrated salesmanship brings better results.

New Utilities Rule Aims to Reduce Excessive Valuations

A new theory of application of valuations of public utility companies for rate-making purposes, which he believes will cure the constant attempts of such companies to inflate their investment valuations to justify higher rates, was advanced recently by H. E. Nease, Chief Statistician of the West Virginia Public Service Commission, in his report on the petitions of the West Virginia Public Service Company, the West Virginia and Maryland Gas Company, and the Northern Natural Gas Company, for permission to increase rates.

The theory is that "if the present value of a property is greater or less than its actual cost, the difference between the present value and the actual cost should be added to or taken from the actual net earnings, to get the actual net gain or return to the owners of the property. In other words, the net return to the owner of the property is not measured by the net earnings alone, but also is dependent upon the present value of the investment as compared with the actual cost."

Reporting on the West Virginia Central Gas Company, Mr. Nease points out that "in connection with the drilling of wells and laying of field mains, it has been the practice of this company to charge to 'expense' the actual cost of drilling, labor and hauling, and to 'investment' the casing, tubing and field lines.

If the entire cost of the wells and field lines had been charged to investment, and I am firmly of the opinion that good accounting demands that this should be the practice, the total investment of this company would be approximately $400,000 greater than it is.

"It naturally follows that if this $400,000 had been put into investment instead of into expense, the total net earnings would be correspondingly greater by $400,000, and the average rate of return on the average investment would be approximately 17 per cent instead of 12½ per cent."

California Commission Makes New Ruling for Gas Deposits

The railroad commission of California has authorized the Los Angeles Gas & Electric Corporation, the Southern California Edison Company and the Southern California Gas Company to put into effect a slightly different rule for gas deposits, so that they may require a $2 deposit for temporary seasonal occupancy of flats, apartments, etc., of four rooms or less, $2.50 for houses up to seven rooms and $5 for houses of eight rooms or more.

The maximum deposit under the commission's rule is $2.50 for the guarantee of bills for residence and domestic gas and electric service, but the companies showed the commission that they were not protected in the collection of accounts where the average monthly bill was in excess of $2.50 among transitory residents.

New Gas Plant at Evansville, Ind.

Evansville, Ind., is to have a new gas plant costing $25,000. Coke ovens are to be used to conserve the supply yielded in making the coal gas. An apparatus to purify the gas before it is allowed to go into the mains is also to be installed.

Wilmington (Del.) Company May Make Regular Increase Instead of Meter Charge

That the Wilmington, Del., Gas Company is willing to put into effect a general increase in gas rates, rather than a 25-cent meter charge is understood to be the attitude the company's representatives will take at the next public meeting of the Board of Public Utilities Commissioners.

It was learned that at the private meeting of the utilities commissioners with representatives of the gas company recently, Harold S. Schutt and Colonel Edmund Mitchell, officers of the gas company, stated they were not bound to the increase in the meter charge, which they thought the fairest way of providing additional revenue to meet increasing expenses. They stated that they had no objection, if the utilities board deemed it advisable, to make a general increase in gas rates instead of fixing a monthly meter charge.

The gas company is preparing a financial statement showing the increased cost of operations because of soaring prices of materials, increases in wages for workmen, etc. This statement will be submitted to the utilities board.

It is likely that, because of the public objection to the 25 cents a month meter charge, the utilities board may suggest a general increase in the gas rate to all consumers instead.

It is figured that the meter charge of 25 cents a month would bring in about $60,000 more revenue to the company in a year, and a ten-cent increase in gas rates per thousand feet, or withdrawal of the 10 per cent discount, would give the company about $55,000 a year more revenue.

Secretary of Utilities Association Foresees Radical Changes

In his annual report to the Massachusetts Electric and Gas Association, the secretary, Everett W. Burdett, one of the keenest legal minds in the country, points out that important readjustments between utility companies and the community may be expected as a result of the war. Citing the socializing of industries in the belligerent European countries, Mr. Burdett thinks it quite possible that the close of the war may see some of the temporary adjustments made permanent. He says:

"What the outcome of all this is to be, we do not venture to predict. We simply record the extraordinary developments of the past year as a matter of absorbing interest to our industry, and suggest that they will require the most careful study and the wisest disposition by those who control the industry. It may be that considerable revision of our former views, and a considerable readjustment of things which we have been in the habit of regarding as fundamental, may be required. The problems of the future promise to be even more serious than those of the past; but as the common sense and high capacity of the leaders in the industry have heretofore met and conquered the difficulties of the past, so they may be safely assumed to be equal to the successful solution of the problems of the future. But the thing which must in wisdom be insisted upon is that former rules or standards shall no longer necessarily have the sanctity of the laws of the Medes and Persians, but that the kaleidoscopic changes of the future shall be met with open minds.

"Many changes produced by the colossal conflict in which the world is now engaged may prove permanent, however disconcerting such a result may be to our preconceived ideas. Other departures from accepted practice may be partially readjusted, and in other cases normal conditions may be entirely restored; but the methods by which, and the extent to which, this will happen is still a problem of the future."

Chicago Coal and Coke Shortage is Feared

Unless the federal fuel administration comes to the aid of the Peoples' Gas Light & Coke Company of Chicago in the matter of coal and coke supply, the second largest city of the United States will be face to face with a serious gas famine this winter, E. G. Cowdery, president of the Peoples' company told Fuel Administrator Garfield at Washington last week.

This was the second time within recent weeks that Mr. Cowdery has gone to Washington in an effort to obtain relief from what threatens to be a serious situation. Mr. Cowdery returned to Chicago with Mr. Garfield's promise that the fuel administration would see to it that the Peoples' company received 10,000 tons of anthracite coal and 19,000 tons of coke monthly.

"If we get the amount of fuel promised we will still be short about 16,000 tons a month to manufacture the gas supply which Chicago will need in the winter months," Mr. Cowdery said. "Unless we can get more assurances than we were able to get from the fuel administration there is certain to be a gas shortage. And if we don't get all that the administration promises us now the situation will be serious. We will be able to run until the middle of November on the fuel supply we have now and are sure of. After that we are dependent upon what the government may be able to do for us."

Statements made by Mr. Cowdery before his last departure for Washington indicated that unless the coal situation were bettered the company's output of gas would be from 5,000,000 to 20,000,000 cu. ft. short of the demand that is expected to come during December and January. To meet this deficiency it will probably be necessary to lower the pressure in the gas mains.

"The Peoples' gas company needs about 45,000 tons of fuel a month," Mr. Cowdery said. "As a result of our best efforts we have in storage only a few day's supply. It is not a question of price. When we try to buy anthracite coal we are told that the government has commandeered most of the supply for use in the navy and elsewhere.

"We have explained to Mr. Garfield that as a result of the more or less general fuel shortage in Chicago the demand for gas has greatly increased. Hundreds of people have taken to using gas stoves and heaters, and many manufacturers have put in gas power plants.

"Even if we get our full requirements of hard coal we shall not be able to supply all the gas which Chicago will need during the winter months unless we are able to increase our coke supply. Our maximum capacity when only coke is used is 100,000,000 cu. ft. of gas per day. When anthracite coal is used instead of coke there are technical difficulties which reduce the output of gas by 25 per cent, or to approximately 75,000,000 cu. ft.

"Our estimates are that the average amount for which there will be a demand during December and January will be 80,000,000 cu. ft. a day. That will leave a shortage of 5,000,000 cubic feet. The greatest amount of gas for which there will be a demand during these months we estimate at 95,000,000 cu. ft. a

day which is 20,000,000 ft. above our probable capacity.

"Although we are about to build an entirely new plant, we have, in an effort to piece out our capacity, contracted for the building of new water gas units at a price of $500,000. But conditions are such that we can get no promise of having them completed before August, 1918.

"Therefore, except in the improbable event that we can greatly increase our supply of coke, we shall not be able to make enough gas to supply the demands of our customers. The only possible alternative that we can see is to cut down the pressure of gas in the mains. In that way we should be able to give all consumers an equal chance at the available gas supply. The amount to which it would be necessary to reduce the pressure will have to be determined by experiment."

Many United Gas Improvement Men in National Service

The following employees of the United Gas Improvement Company have responded to the nation's call:

Name	Department	Rank
R. Dale Benson, Jr.	General Auditor's	Ass't Paymaster, U. S. N.
A. Richard Baker	New Business	1st Lieut., O. R. C.
R. W. Booze	Construction	2nd Lieut., O. R. C.
C. F. Chambers	Manufacturing	Lieut., Jr. Grade, Naval Reserve Force
Walton Clark, Jr.	Legal	Captain, N. G.
Theobald F. Clark	Manufacturing	Captain, O. R. C.
William F. Dalton	Manufacturing	2nd Lieut., O. R. C.
J. E. Fulweiler	Manufacturing	Ensign, Naval Coast Defense Reserve
Walter Gallagher	Manufacturing	1st Lieut., O. R. C.
Edgar S. Husband	Commercial	Lt., Jr. Grade, Nav. Coast Def. Reserve
Robert Kauch	New Business	1st Lieut., O. R. C.
H. V. Lindsay	Distribution	1st Lieut., O. R. C.
R. P. Minnick	Construction	1st Lieut., Aviation Corps
H. H. Nevanas	Manufacturing	Lieut., Sr. Grade, Naval Reserve Force
J. R. Oakman	Manufacturing	1st Lieut., N. G.
J. J. Regan, Jr.	Construction	2nd Lieut., O. R. C.
C. D. Shaw, Jr.	Manufacturing	1st Lieut., N. G.
P. P. Smith	Treasurer's	2nd Lieut., O. R. C.
C. H. Thacher	Distribution	2nd Lieut., Engineers' O. R. C.
H. E. Tisdale	Manufacturing	2nd Lieut., O. R. C.
H. A. Yearsley	Commercial	2nd Lieut., O. R. C.
S. P. M. Tasker	Manufacturing	Senior Lieut., Naval Reserve Force
W. J. Cheyney	Charleston	2nd Lieut., U. S. A.
A. M. Mixson	Charleston	1st Lieut., O. R. C.
G. W. Walker, Jr.	Charleston	2nd Lieut., O. R. C.
J. Russell Snyder	Norristown	1st Lieut., Signal O. R. C.
C. Lefler Mason	Fulton County	2nd Lieut., O. R. C.
S. W. Marshall	Fulton County	1st Lieut., O. R. C.
H. N. Woodson	Kansas City	1st Lieut., N. G.
C. G. Butterfield	Kansas City	Captain, N. G.
E. R. Curtin, Jr.	Lima	Captain, N. G.
C. C. Jones	Manchester	Captain, N. G.
B. K. Cash	Wabash	2nd Lieut., N. A.
A. V. S. Lindsley	Hammond	1st Lieut., O. R. C.
H. C. Moriarity	Fort Wayne	2nd Lieut., N. G.
D. D. Atkinson	Northern Liberties	2nd Lieut., O. R. C.
Kent C. Mead	Omaha	2nd Lieut., O. R. C.
Frank Ray	Savannah	1st Lieut., O. R. C.
K. W. Mayne	Sioux City	2nd Lieut., N. G.

Investigation Reflects No Blame on Chicago Company

Another big bubble blown by a misinformed daily press seeking to play the role of "the public's protector" at the expense of a gas company was exploded when Coroner Hoffman of Chicago after a thorough investigation last week absolved the Peoples' Gas Light & Coke Company of any blame for the death of 27 persons by gas in Chicago since Oct. 1 this year.

Newspapers playing to the grandstands and politicians who saw a means of gaining a reputation as "friends of the masses" set up a cry of "It's due to the poor quality of gas" every time a body was found in a gas filled room.

The gas company was blamed even in cases where there was decided evidence of suicide. Coroner Hoffman made an investigation with the revelation that 27 deaths by gas during the month of October was not at all an unusual number, for the records of October, 1916, attributed 32 deaths to gas, accidental and intentional. In January last year there were 26 deaths by gas in Chicago.

Fire Chief McDonell of Chicago has issued the following "don'ts" to gas users:

"Don't leave the gas on while you go for another match if the first match goes out, or if the flames pop out when first lighted.

"Don't turn on the gas in an oven before you open the oven door; open the door first, light your match, and then turn on the gas.

"Don't keep your matches on the stove.

"Don't have any inflammable draperies near the stove or range."

Utah Plant Soon to Begin Extracting Toluol

Salt Lake City may soon be doing its share in assisting in the manufacture of munitions of war for the use of Uncle Sam and his allies if plans of the Utah Gas & Coke Company for the manufacture of toluol, a by-product of gas plants, used extensively in the making of high explosives, are consummated.

Charles O'Brien Murphy, assistant general manager of the American Public Utilities Company, operating this Utah gas plant, spent several days in Salt Lake City conferring with C. M. Eyman, general manager of the Salt Lake gas works, relative to the company engaging in the manufacture of toluol. Government specifications and plans were discussed and a decision reached to produce toluol in Salt Lake City if contracts insuring sufficient governmental support can be secured.

Toluol is now being extracted from gas by many of the largest gas producing plants of the East and middle West. It is supplied to the big explosive manufacturers through the government, which desires its manufacture by the Salt Lake plant because of its size and producing capacity. The by-product is most essential in the manufacture of high explosives and the Government is accepting all that can be produced for its own use and for supplying the Allies.

"Toluol as produced by the gas plants of England has been the savior of the British government as far as the manufacture of munitions is concerned," said Mr. Murphy. "It is being used more and more in this country, and it is only a matter of time and the installation of the necessary machinery before all the big gas works here will be making it."

Large Well Reported at Findlay, Ohio

The Ohio Oil Company has brought in a gas well in the Little Buffalo field of Wyoming, which is said to be the largest in the district. It is flowing 80,000,000 cubic feet of gas daily. Gas was struck at 1,720 feet with a 12½-inch hole.

New Albany Company Announces Reduction in Rates to Large Consumers

The United Gas & Electric Company of New Albany, Ind., has announced a reduction in gas rates to large consumers.

Personal Notes

LESLIE B. CROSSMAN, formerly a solicitor for the Fitchburg (Mass.) Gas & Electric Company, has been appointed assistant paymaster in the navy with rank of ensign and has been ordered to Bath, Me. Mr. Crossman, who had been employed by the gas company about a year, enlisted in the naval reserves as chief yeoman in June. His ability and qualifications were such that he was transferred to a naval school at the Catholic University at Washington, D. C., and on Oct. 8 he was one of a class of 25 which was graduated.

JOHN R. ELLIS, who has been superintendent of the gas plant of the Iowa Railway & Light Company, Marshalltown, Ia., has resigned and accepted a position as gas superintendent of the Waxahachie (Tex.) Gas Company.

JOHN N. CALDER, for a number of years an employee of the Southern Public Utilities Company, Charlotte, N. C., is a member of the National Army stationed at Camp Jackson, Columbia, S. C.

PAUL DOTY, vice-president and general manager of the St. Paul (Minn.) Gas Light Company, recently left for Camp Grant, near Rockford, Ill., where he will assume charge of all utilities, including water sewerage and lighting. He will enter the service with a major's commission, as was noted in the April 14 number of the AMERICAN GAS ENGINEERING JOURNAL. Major Doty has had ten years' experience in the national guard. Four captains will comprise his commissioned staff. He will have 300 men serving under him.

WILLIAM B. OSBORNE, engineer of the Lowell (Mass.) Gas Light Company for the past two years, has recently been selected president and general manager of the Worcester (Mass.) Gas Light Company, succeeding Dana D. Barnum, who was elected vice-president of the Boston Consolidated Gas Company, as was noted in the Sept. 8 issue of the AMERICAN GAS ENGINEERING JOURNAL. Mr. Osborne was formerly construction engineer for the Riley-Conley Manufacturing Company, which company built the Worcester plant.

WILLIAM H. FROST, for many years connected with gas companies in Detroit and vicinity, died Oct. 10, 1917. He became general manager of the Detroit & Suburban Gas Company in 1902, and retained that position until it became consolidated with the Detroit City Gas Company, Detroit, Mich., since which time he has been connected with the new organization.

CHARLES DAVIS TIFFANY, formerly connected with the Peoples' Gas Light & Coke Company, Chicago, Ill., died Oct. 1, 1917. Mr. Tiffany was more recently connected with the Union Carbide Sales Company, as manager of the Cuba plant.

THE PACIFIC GAS & ELECTRIC COMPANY employees held an outing at Wrights' Beach, Sunday, Oct. 7, at which there was about fifty present. At noon a generous luncheon was provided and the usual beach festivities were enjoyed.

Construction Notes

Bond Issue to be Authorized for New Niagara Falls Gas Plant

A. W. Gray recently returned from Albany, where he attended a hearing before Chairman Van Santvoord, of the Public Service Commission, in the matter of the Niagara Falls (N. Y.) Gas & Electric Light Company's application for permission to issue bonds enabling the construction of a new and modern gas plant in this city and extend the company's mains.

Mr. Gray, appearing as attorney for the company, urged that the permit be granted without delay, the commission having had the matter before it since last February. The urgent need of the new plant and extensions was made plain to Commissioner Van Santvoord. He thereupon stated that, in view of what had been shown at the hearing, he believed an order permitting the proposed issue of sufficient bonds to enable the construction of the new plant and extensions of the mains to meet the needs of the city now existing, as well as for some time to come, should be granted.

He stated that it would be made shortly. Issuance of a bond issue of about $300,000 at this time is desired by the company. The order will probably specify such amount. The company's plans for the new plant and extensions were prepared some months ago.

The Toronto officers of the company accompanied Mr. Gray to Albany and attended the hearing.

Producer Plant Contract Awarded

The contract for the erection of the building in which will be located the gas plant at the new band instrument factory of Frank Holton & Company, at Elkhorn, Wis., has been awarded to Bonnett & Company, of Milwaukee. The matter was closed up recently, and work upon the new structure will start at once. Bonnett & Company are the same contractors who erected the new factory structure.

The gas plant building will be of brick and concrete construction, and with the equipment of gas producing machinery installed will represent a cost of approximately $5,000. The plant will be located toward the northwest corner of the factory building. It will be completed by early winter.

Brockton Company Increasing Its Coal-Gas Manufacturing Capacity

The Brockton Gas Light Company of Brockton, Mass., is refilling its vertical coal-gas plant with silica retorts of increased capacity, remodeling secondary air supplies, etc., for the purpose of largely increasing its coal-gas manufacturing capacity. The work, which is being done by the Isbell-Porter Company of Newark, N. J., will be completed about the first of next year. George H. Priest is general manager for the Brockton company.